LOEWE

VV5000M

MODEL

SERVICE MANUAL

TABLE OF CONTENTS

SECTION 1
SUMMARY

KEY TO ABBREVIATIONS **1-1**
IMPORTANT SAFETY PRECAUTIONS **1-2**
- Precautions during Servicing

SAFETY CHECK AFTER SERVICING **1-3**
- Insulation resistance test
- Dielectric strength test
- Clearance distance
- Leakage current test

INTRODUCTION **1-4**
FEATURES **1-4**
SPECIFICATIONS **1-4**
LOCATION OF CUSTOMER CONTROLS **1-5**

SECTION 2
CABINET & MAIN FRAME

SERVICE FIXTURE CONNECTING METHOD **2-1**
1. SVC FIXTURE Connecting Method 2-1
2. Electrical Service Fixture List 2-2

CABINET DISASSEMBLY **2-3**
1. Top Case, Bottom Cover 2-3
2. Front Panel 2-3

CIRCUIT BOARD DISASSEMBLY **2-3**
1. Circuit Board Arrangement 2-3
2. Main Circuit Board (1) (Audio, Tuner/IF, Syscon, Servo) 2-4
3. Y/C Circuit Board (Y/C, F-OSD) 2-4
4. Timer/Key Function Circuit Board 2-4
5. Pre-Amp Circuit Board 2-4
6. Power Circuit Board 2-5
7. BS Circuit Board 2-5

EXPLODED VIEWS **2-5**
1. Cabinet & Main Frame Section 2-5
2. Packing Accessory Section 2-7
3. Remote Control Section 2-7

SECTION 3
ELECTRICAL

ELECTRICAL ADJUSTMENT PROCEDURES **3-1**
Electronic Test Equipment Requirement **3-1**
1. Servo Circuit 3-1
2. Audio Circuit 3-1
3. Tuner/IF Circuit 3-2

BLOCK DIAGRAMS **3-3**
1. Power (SMPS) Block Diagram 3-3
2. Audio Block Diagram 3-4
3. Servo, System Control & Timer Block Diagram 3-5
4. Y/C Block Diagram 3-7
5. Pre-Amp Block Diagram 3-9
6. Function OSD Block Diagram 3-10
7. Tuner/IF Block Diagram 3-11
8. BS Block Diagram 3-15

CIRCUIT DIAGRAMS **3-17**
1. Power (SMPS) Circuit Diagram 3-17
2. Servo Circuit Diagram 3-21
3. Y/C Circuit Diagram 3-25
4. Audio Circuit Diagram 3-27
5. Timer Circuit Diagram 3-29
6. System Control Circuit Diagram 3-33
7. Tuner/IF Circuit Diagram 3-35
8. Premiere Circuit Diagram 3-41
9. Pre-Amp Circuit Diagram 3-43
10. Function OSD Circuit Diagram 3-45
11. BS Circuit Diagram 3-49
12. Connection Diagram 3-51

DECK JUNCTION **3-53**
1. Deck Junction Circuit Diagram 3-53
2. Deck Junction P.C.Board 3-53

PRINTED CIRCUIT BOARD DIAGRAMS **3-55**
1. Main 1 P.C.Board 3-55
2. Y/C P.C.Board 3-57
3. Function OSD P.C.Board 3-58
4. Power P.C.Board 3-59
5. Pre-Amp P.C.Board 3-60
6. Timer P.C.Board 3-59
7. Key Function P.C.Board 3-60
8. IF P.C.Board 3-61
9. Junction P.C.Board 3-62
10. SCART P.C.Board 3-61
11. BS P.C.Board 3-63

SECTION 4
MECHANISM

NOTE) The table of contents for this section is edited separately.

SECTION 1 SUMMARY

KEY TO ABBREVIATIONS

A	AC	Alternating Current
	ACC	Automatic Color Control
	ADJ	Adjust
	A/E	Audio Erase
	AFC	Automatic Frequency Control
	AFT	Automatic Fine Tuning
	AGC	Automatic Gain Control
	ALC	Automatic Level Control
	AM	Amplitude Modulation
	AMP	Amplifier
	ANT	Antenna
	APC	Automatic Phase Control
	ASSY	Assembly
	AUD	Audio
	AUTO	Automatic
	AUX	Auxiliary
B	B	Base
	BPF	Bandpass Filter
	BW or B/W	Black and White
C	C	Capacitor, Chroma, Collector
	CAN	Cancel
	CAP	Capstan
	CATV	Cable Television
	CBA	Circuit Board Assembly
	CCD	Charge Coupled Device
	CFG	Capstan Frequency Generator
	CH	Channel
	CHROMA	Chrominance
	CLK	Clock
	CNR	Chroma Noise Reduction
	COMB	Combination
		Comb Filter
	COMP	Comparator
		Composite
		Compensation
	CONV	Converter
	CS	Chip Select
	CST	Cassette
	CTL	Control
	CUR	Current
	CYL	Cylinder
D	D	Drum, Digital, Diode, Drain
	dB	Decibel
	DC	Direct Current
	DEMOD	Demodulator
	DET	Detector
	DEV	Deviation
	DHP	Double High Pass
	DIGITRON	Digital Display Tube
	DL	Delay Line
	DOC	Drop Out Compensator
	D/V	Dummy Vertical
E	E	Emitter
	EE	Electric to Electric
	EMP	Emphasis
	EP	Extended Play
	EQ	Equalizer
	ES	Electrostatically Sensitive
F	F	Fuse
	FB	Feed Back
	FBC	Feed Back Clamp
	FE	Full Erase
	FF	Fast Forward
	FG	Frequency Generator
	FL	Filter
	FM	Frequency Modulation
	F/R	Front/Rear
	FS	Frequency Synthesizer
	FSC	Subcarrier Frequency
	F/V	Frequency Voltage
	FWD	Forward
G	GEN	Generator
	GND	Ground
H	H	High, Horizontal
	Hz	Hertz
I	IC	Intergrated Circuit
	IF	Intermediate Frequency
	INS	Insert
	I/O	Input/Output
L	L	Low, Left, Coil
	LD	LED
	LECHA	Letter Character
	LP	Long Play
	LPF	Low Pass Filter
M	MAX	Maximum
	MD	Modulator
	MIC	Microphone
	MIN	Minimum
	MIX	Mixer, Mixing
	M.M.	Mono Multi Vibrator
	MMV	Monostable Multivibrator
	MOD	Modulation, Modulator
	MODEM	Modulator-Demodulator
N	NR	Noise Reduction
O	OSC	Oscillator
	OSD	On Screen Display
P	PB	Playback
	PCB	Printed Circuit Board
	PG	Pulse Generator
	PLL	Phase Locked Loop
	P-P	Peak-to-Peak
	PRE-AMP	Preamplifier
	PS	Phase Shift
	PWM	Pulse Width Modulation
Q	Q	Transistor
	QH	Quasi Horizontal
	QSR	Quick Setting Record
	QTR	Quick Timer Record
	QV	Quasi Vertical
R	R	Resistor, Right
	RE(or RC)	Remocon, Receiver
	REC	Recording
	REF	Reference
	REG	Regulated, Regulator
	REMOCON	Remote Control(unit)
	REV	Reverse
	REW	Rewind
	RF	Radio Frequency
	R/P	Record/Playback
	RTC	Real Time Counter
S	S	Serial
	SH	Shift
	SHARP	Sharpness
	SIF	Sound Intermediate Frequency
	SLD	Side Locking
	S/N	Signal to Noise Ratio
	SP	Standard Play
	SUB	Subtract, Subcarrier
	SW or S/W	Switch
	SYNC	Synchronization
	SYSCON	System Control
T	T	Coil
	TP	Test Point
	TR	Transistor
	TRK	Tracking
	TRANS	Transformer
	TU	Tuner, Take-Up
U	UHF	Ultra High Frequency
	UNREG	Unregulated
V	V	Volt, Vertical
	VA	Always Voltage
	VCO	Voltage Controlled Oscillator
	VGC	Voltage Gain Control
	VHF	Very High Frequency
	VISS	VHS Index Search
	VR	Variable Resistor or Volume
	V-Sync	Vertical Synchronization
	VTG	Voltage
	VV	Voltage to Voltage
	VXO	Voltage X-tal Oscillator
W	W	Watt
	WHT	White
	W/O	With Out
X	X-TAL	Crystal
Y	Y/C	Luminance/Chrominance
	YNR	Luminance Noise Reduction
Z	ZD	Zener Diode

IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, the products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced

• Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (■) parts are critical for safety.
Replace only with specified part numbers.
Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Use Specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistor

5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering (Fig. 1)

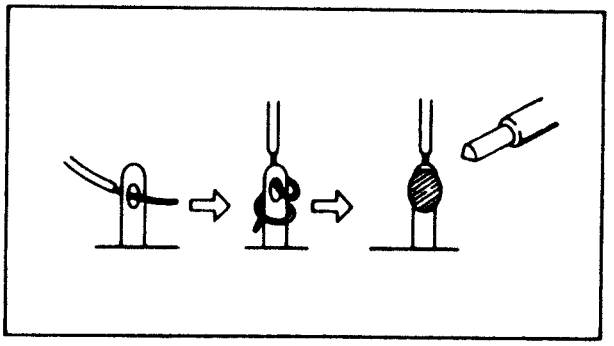


Fig. 1

6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

7. Check that replaced wires do not contact sharp edged or pointed parts.

8. When a power cord has been replaced, check that 10-15Kg of force in any direction will not loosen it.(Fig. 2)

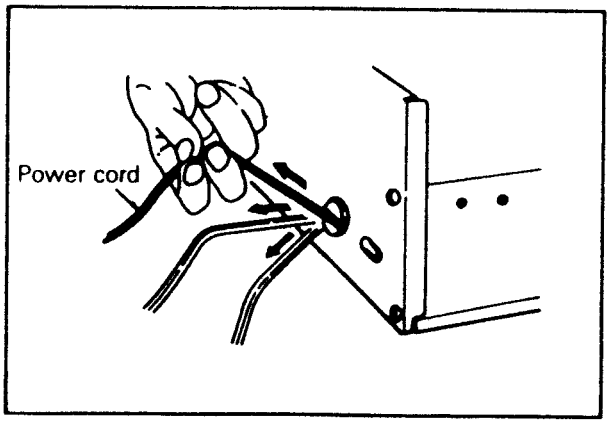


Fig. 2

9. Also check areas surrounding repaired locations.

10. Products using cathode ray tubes (CRTs)
In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the parts specified. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

SAFETY CHECK AFTER SERVICING

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

• Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table below.

• Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table below.

• Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table below.

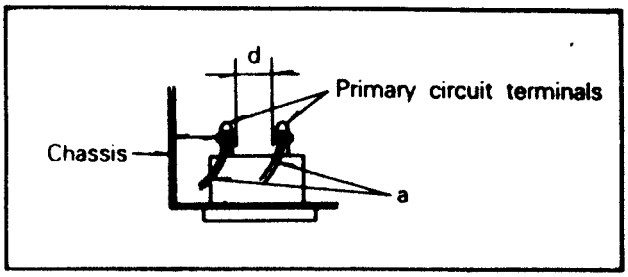


Fig. 3

Table 1:Ratings for selected areas

AC Line Voltage	Region	Insulation Resistance	Dielectric Strength	Clearance Distance(d),(d')
*110 to 130 V 200 to 240 V	Europe Australia	≧10 MΩ/500 V DC	4kV 1 minute	≧ 6mm(d) ≧ 8mm(d') (a Power cord)

*Class II model only.

Note: This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality

• Leakage Current test

Confirm specified or lower leakage current between B(earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.)

Measuring Method: (Power ON)
Insert load Z between B(earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure and following table.

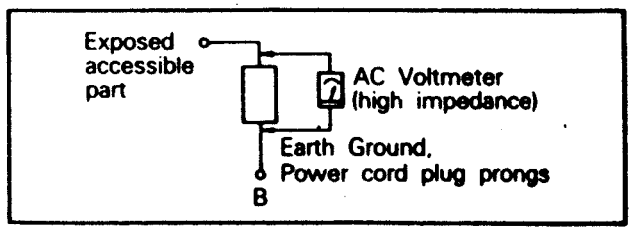


Fig. 4

Table 2:Leakage current ratings for selected areas

AC Line Voltage	Region	Load Z	Leakage Current(i)	Earth Ground (B) to:
100 to 130 V	Europe	2kΩ	i≦0.7m A peak i≦2m A dc	Antenna earth terminals
200 to 240 V	Australia	50kΩ	i≦0.7m A peak i≦2m A dc	Other terminals

Note: This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

INTRODUCTION

This service manual provides a variety of service information. It contains the mechanical structure of the Video Cassette Recorder (VCR) together with mechanical adjustments and the electronic circuits in schematic form.

This VCR was manufactured and assembled under our strict quality control standards and meets or exceeds industry specifications and standards.

FEATURES

- Double Azimuth 2-head system
- HQ, High Quality picture enhancement system improves image sharpness and detail
- 8 event/1 year programmable timer with everyday recording
- Programmable channel memory with frequency synthesized tuner (up to 99 positions)
- Full function infrared remote control
- Digital Link System
- TV Programmer
- QSR, Quick Set Recording with standby (up to 9 hours)
- Auto Power and Play Function
- Automatic Rewind
- Jet Search, Logic Search Function
- Tape Remaining time Display Function
- Fine Still, Frame Advance Function
- VISS (VHS Index Search System) Function
- Auto Head Cleaner
- Quick Start Function
- Real Time Counter
- Logic Auto Tracking System
- Digital Auto Tracking System
- Child Lock Function
- Centre Mechanism
- ACSS (Automatic Clock Setting System) Function
- VACP Plus (Video Automatic Channel Programme) Function
- VPS (Video Programming System)
- Built in ShowView Programming
- Premiere Compatible
- BS Tuner (only for VV 5000 MS)

* ShowView is a trademark applied for by Gemstar Development Corp.
ShowView system is manufactured under license from Gemstar Development Corporation.

SPECIFICATIONS

General

Power Source :	AC 230V ± 10%, 50Hz
Power Consumption :	Approx. 38 Watts (VV 5000 MS)/19 Watts (VV 5000 M)
Video Recording System :	Double Azimuth 2 heads helical scanning system
Tape Speed :	23.39mm/sec (SP mode)
Tape Format :	Tape Width 1/2" (12.7mm high density tape VHS).
Maximum Recording Time :	4hours at SP mode (with E-240 cassette)
FF/Rewind Time :	Less than 300secs (with E-180 cassette)
Dimensions (W × H × D) :	16.9" × 3.9" × 14.8" (430 × 100 × 375mm)
Weight :	About 13.9 lbs (6.3kg)
Operating Temperature :	41° F-95° F (5° C-35° C)
Operating Humidity :	35%~80%
Timer :	24hours display type

Video

Television System :	CCIR standard (625 lines, 50 fields)
	PAL/SECAM Colour signal
Recording Format :	PAL/MESECAM
RF Reception :	PAL B/G, SECAM B/G
RF OUT :	PAL G, SECAM G
Input Level :	VIDEO IN (SCART type)
	2.0Vp-p, 75ohm, unbalanced
Output Level :	VIDEO OUT (SCART type)
	2.0Vp-p, 75ohm, unbalanced
Signal to Noise Ratio :	More than 43dB
RF Modulator :	UHF Channels 32-40 (Adjustable)

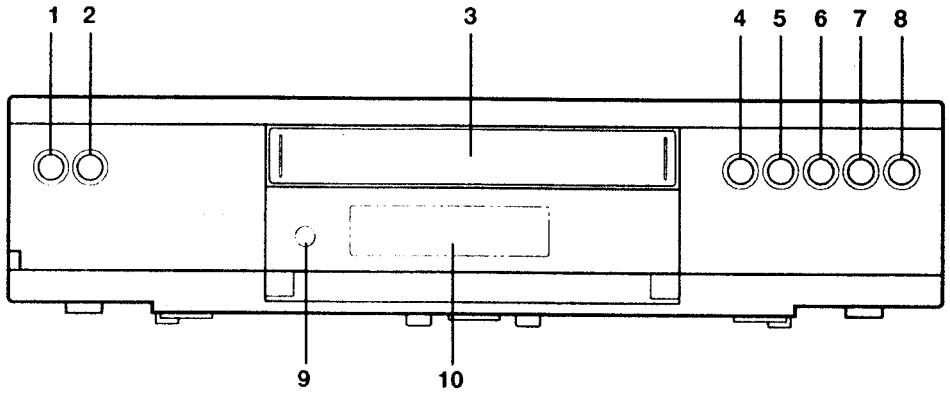
Audio

Input Level :	AUDIO IN (SCART type)
	0dBm More than 10Kohm
Output Level :	AUDIO OUT (SCART type)
	0dBm Less than 1Kohm
Audio Track :	Mono track type
Audio Frequency Response :	Normal : 100Hz~10KHz ($^{+3}_{-6}$ dB)
Signal to Noise Ratio :	More than 43dB

* Designs and specifications are subject to change without notice.

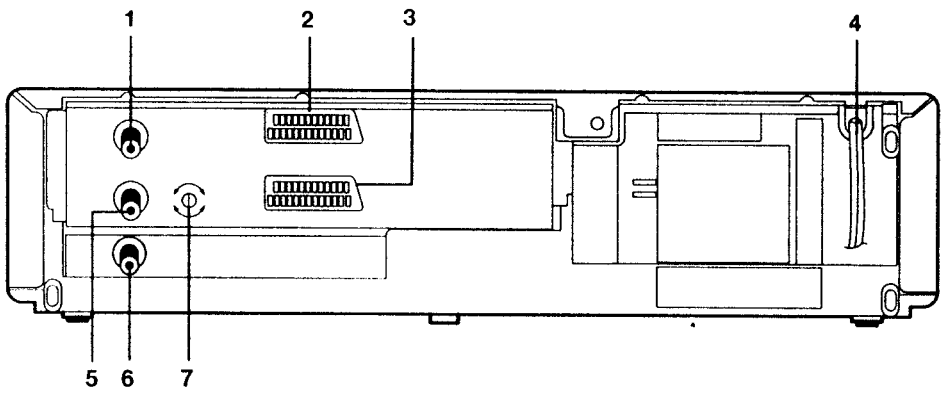
LOCATION OF CUSTOMER CONTROLS

FRONT



1. POWER BUTTON
2. STOP/CASS BUTTON
3. CASSETTE COMPARTMENT
4. STILL IMAGE/PAUSE BUTTON
5. RECORD BUTTON
6. REWIND/REVIEW BUTTON
7. PLAY BUTTON
8. FAST FORWARD/CUE BUTTON
9. REMOTE SENSOR WINDOW
10. MULTI-FUNCTION DISPLAY

REAR



1. AERIAL INPUT
2. EURO-AV1 SOCKET
3. EURO-AV2 SOCKET
4. MAINS LEAD
5. RF OUTPUT
6. LNC IN SOCKET
   (only for VV 5000 MS)
7. RF CHANNEL CONTROL

SECTION 2 CABINET & MAIN FRAME

SERVICE FIXTURE CONNECTING METHOD

1. SVC FIXTURE Connecting Method

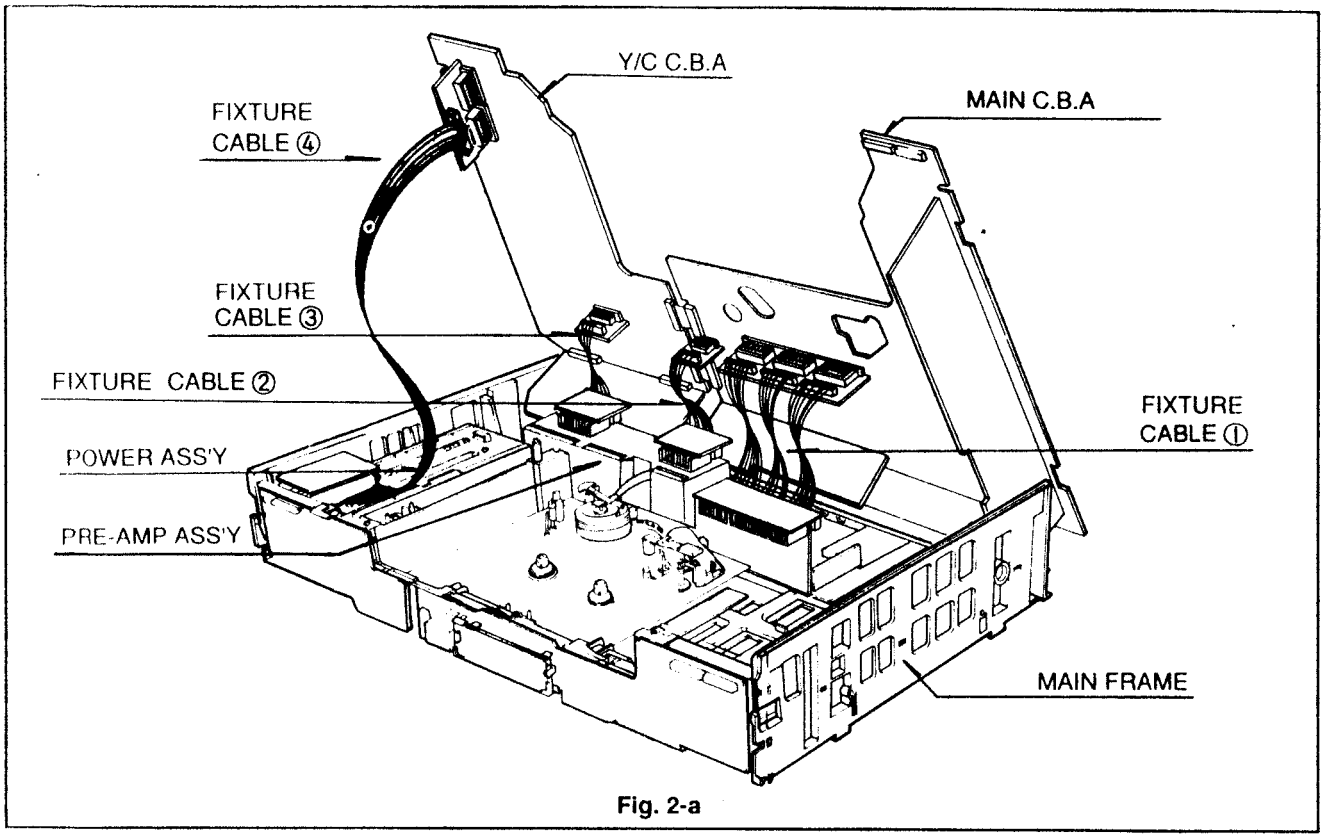


Fig. 2-a

a) Connect the FIXTURE Cable ① between Main C.B.A and Junction C.B.A. (P2D15, P2D14, P2D13)
b) Connect Y/C C.B.A and Main C.B.A to Pre-Amp Ass'y with the FIXTURE Cable ②, ③ (P3809=P8302, P4816=P8403).
c) Connect the FIXTURE Cable ④ between Y/C C.B.A and Power Ass'y. (P3102=PP302, P3103=PP301)

1-1. FIXTURE Cable ① Connecting Method (See Fig. 2-a, 2-b)

a) Connect the connector of "MAIN" mark of FIXTURE Cable ① with the Main C.B.A and the connector of "JUNCTION" mark with the Junction C.B.A.
b) At this time, should be in the left side " ← LEFT" mark on the P.C.B of the FIXTURE Cable ①.

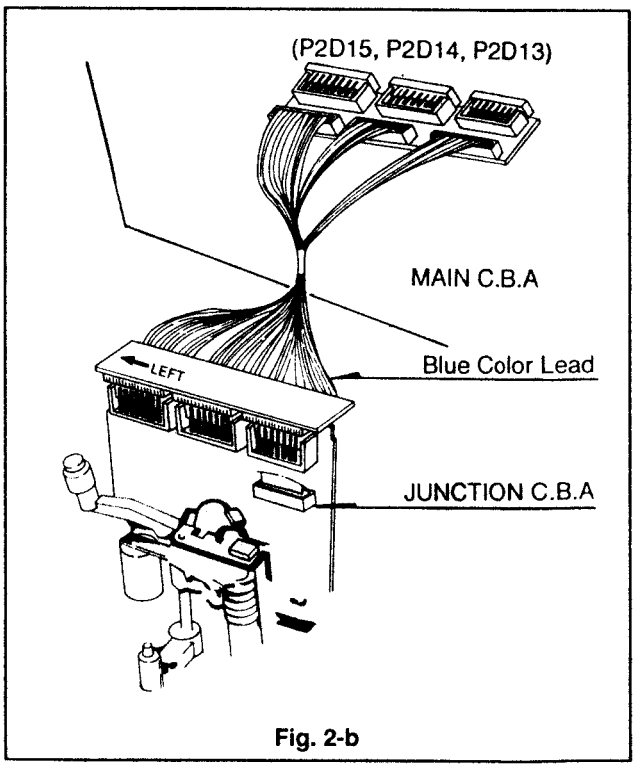


Fig. 2-b

1-2. FIXTURE Cable ②, ③ Connecting Method (See Fig. 2-a, 2-c)

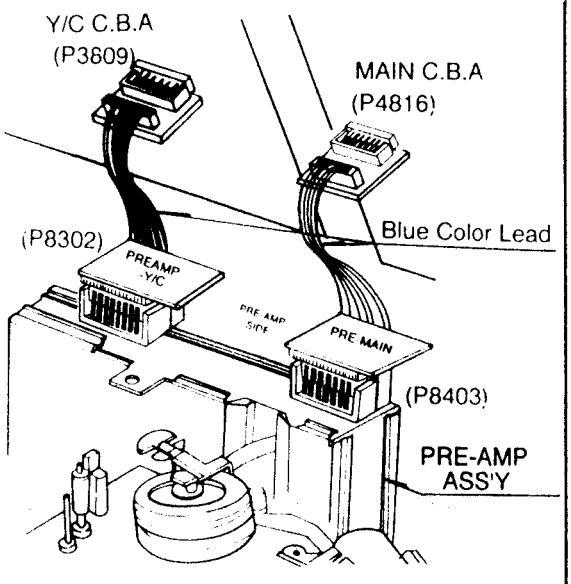


Fig. 2-c

a) Connect the FIXTURE Cable ②, ③ with "PREAMP-Y/C" and "PRE-MAIN" marked on the PCB are placed in a right position to Pre-Amp Ass'y.
b) Connect the FIXTURE Cable ③ with "Y/C-PREAMP" marked on the PCB is placed on the left side to Y/C C.B.A.
c) Connect the FIXTURE Cable ② with "MAIN-PRE" marked on the PCB is placed on the right side to Main C.B.A.

1-3. FIXTURE Cable ④ Connecting Method (See Fig. 2-a, 2-d)

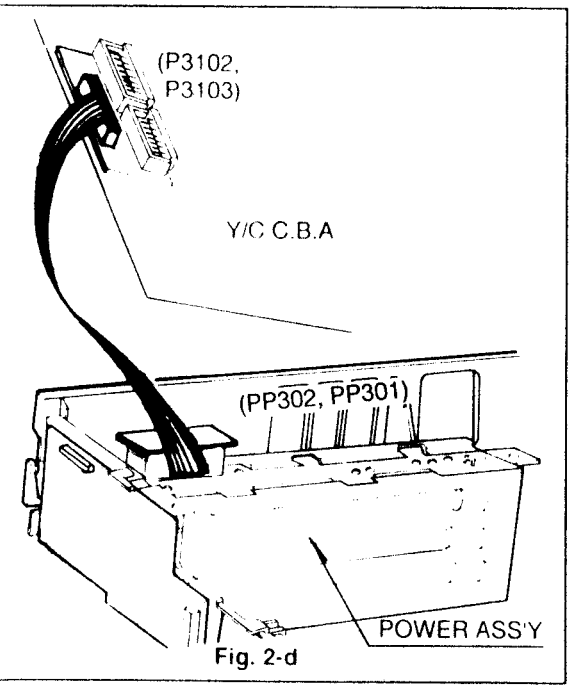


Fig. 2-d

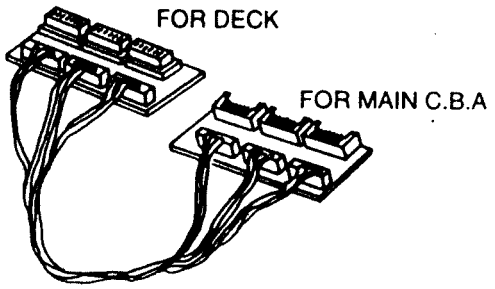
a) Connect the connector of "POWER-Y/C" mark of FIXTURE Cable ④ with Y/C C.B.A and the connector of " Y/C-POWER" mark with the Power Ass'y.

2. Electrical Service Fixture List

A. Fixture Cable Total Assembly (FIX)
Parts No.: 960-015N (Optional Parts)

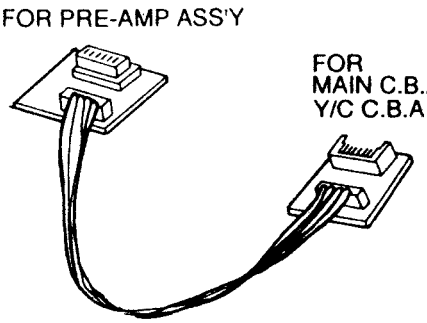
B. Fixture Cable ①. (FIX 1)

Parts No.: 232-972A (Optional Parts)



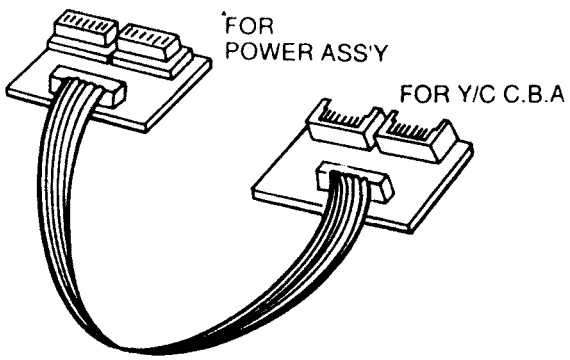
C. Fixture Cable ②, ③. (FIX 2, FIX 3)

Parts No.: 6871R-0233A (FIX 2) (Optional Parts)
6871R-0233B (FIX 3)



D. Fixture Cable ④. (FIX 4)

Parts No.: 6871R-0233C (Optional Parts)



CABINET DISASSEMBLY

1. Top Case, Bottom Cover

A. Release 5 screws (A). (See Fig. 2-1)
B. Hold the back of Top Case and lift it up slightly backward to remove it.
C. Release 8 screws (B). (See Fig. 2-1)
D. Remove the Bottom Cover.

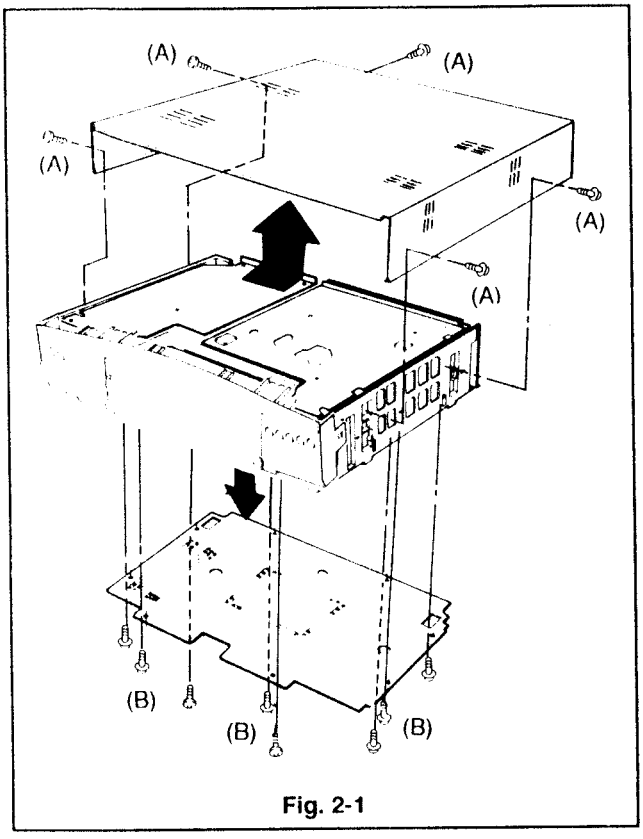


Fig. 2-1

* Caution

When reassemble the Front Panel, assemble it in condition of inserting the Door Cassette inside, as shown in Fig. 2-3.

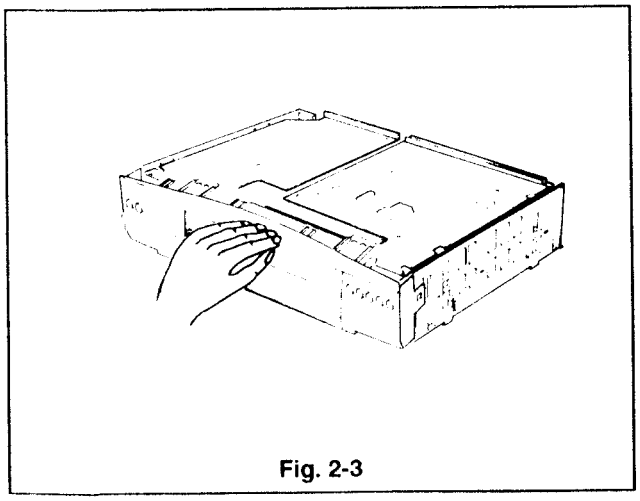


Fig. 2-3

2. Front Panel

A. Remove the Top Case. (See Fig. 2-1)
B. Remove the Bottom Cover. (See Fig. 2-1)
C. Remove the stoppers on the top of Front Panel.
D. Remove the stoppers on the bottom of Front Panel.

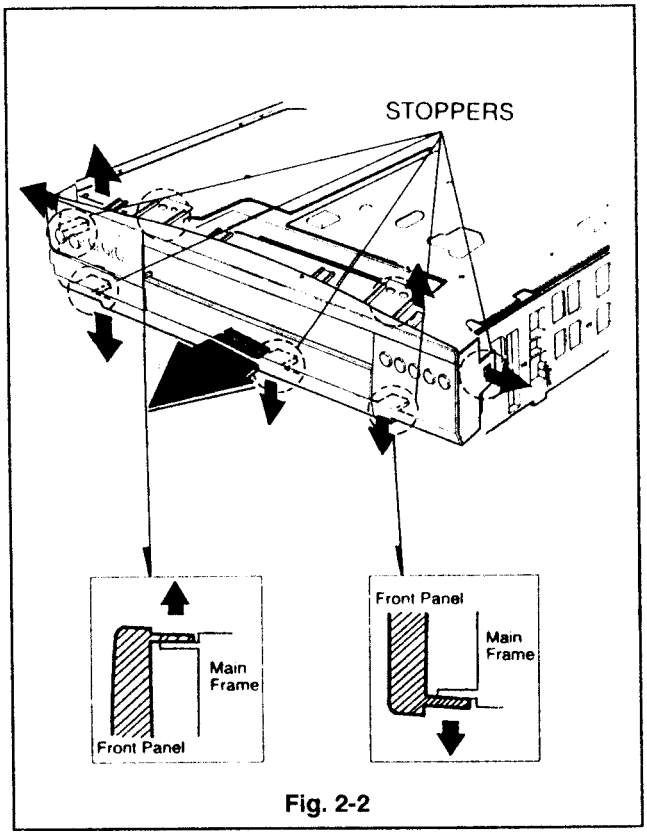


Fig. 2-2

CIRCUIT BOARD DISASSEMBLY

1. Circuit Board Arrangement

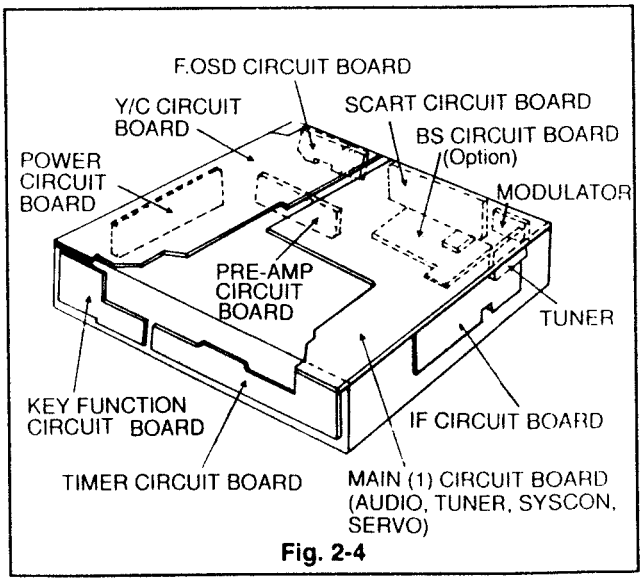


Fig. 2-4

2. Main Circuit Board (1) (Audio, Tuner/IF, Syscon, Servo)

A. Release 4 screws (D). (See Fig. 2-5)
B. Disconnect the connector between Main Circuit Board and Timer Circuit Board.
C. Lift the rear part up and pull the P.C.Board backward.
D. Remove the connector for complete removal.

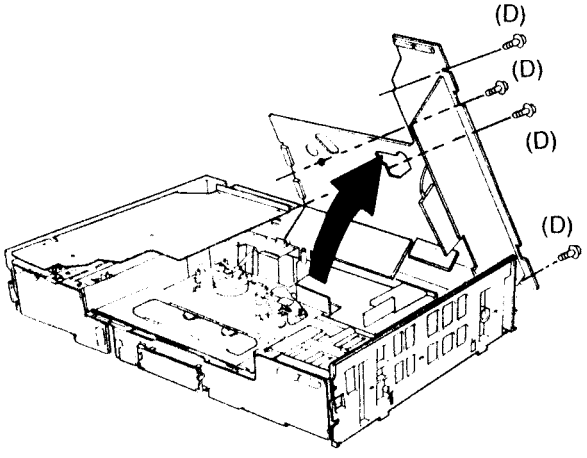


Fig. 2-5

3. Y/C Circuit Board (Y/C, F-OSD)

A. Release 4 screws (E). (See Fig. 2-6)
B. Disconnect the connector between Main Circuit Board and Timer Circuit Board.
C. Disconnect the connector between Main Circuit Board and Power Circuit Board.
D. Lift the rear part up and pull the P.C.Board backward.
E. Remove the connector for complete removal.

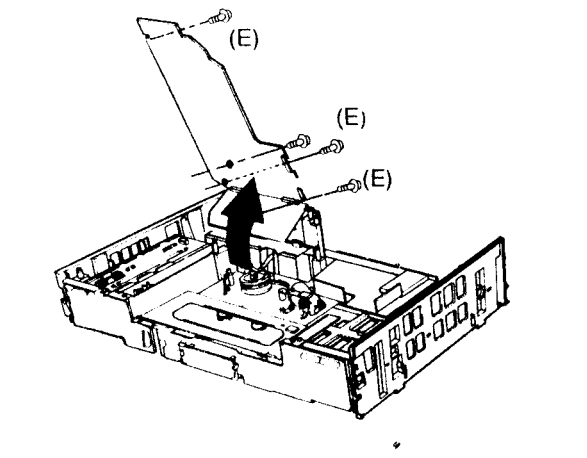


Fig. 2-6

4. Timer/Key Function Circuit Board

A. Pull the P.C.Board toward you while pressing 9 stoppers in the direction of the arrows to disengage, and remove the P.C.Board. (See Fig. 2-7)
B. Remove the connector for complete removal.

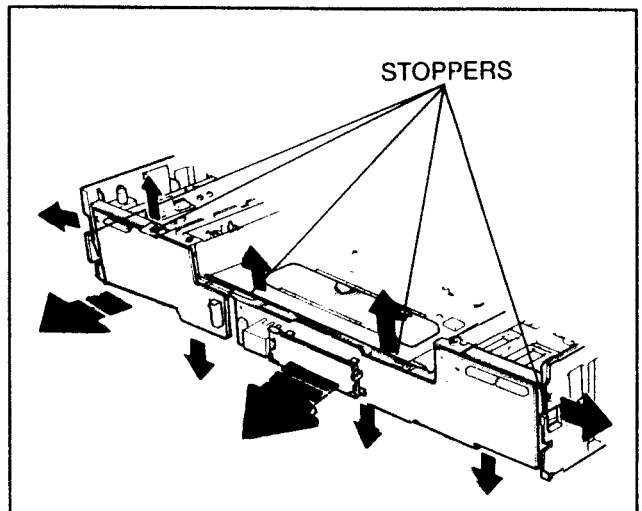


Fig. 2-7

5. Pre-Amp Circuit Board

A. Release 2 screws (F). (See Fig. 2-8)
B. Remove Pre-Amp Package from Main Frame in the direction of arrow (1).
C. Remove bracket Pre-Amp from Pre-Amp Package.
D. Remove Pre-Amp Circuit Board from Pre-Amp Package.

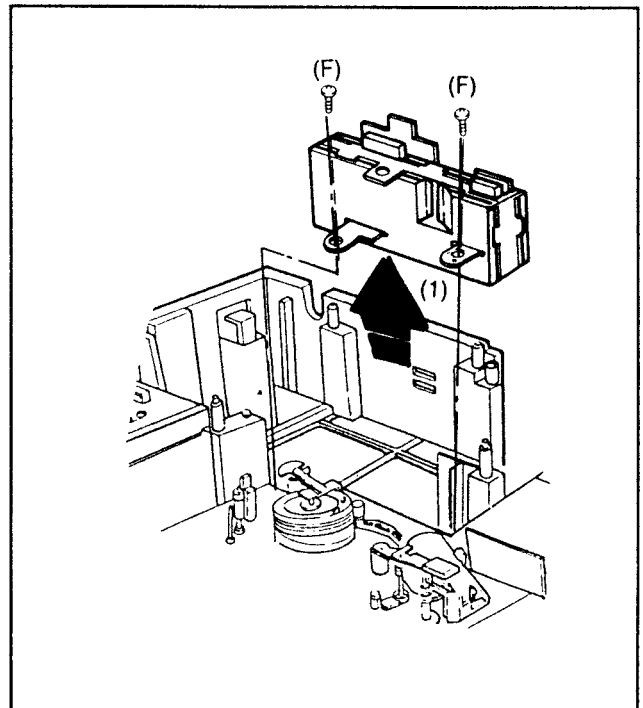


Fig. 2-8

6. Power Circuit Board

A. Remove the Y/C Circuit Board. (See Fig. 2-6)
B. Release 2 screws (G). (See Fig. 2-9)
C. Remove the Power C.B.A in the direction of arrow (2).

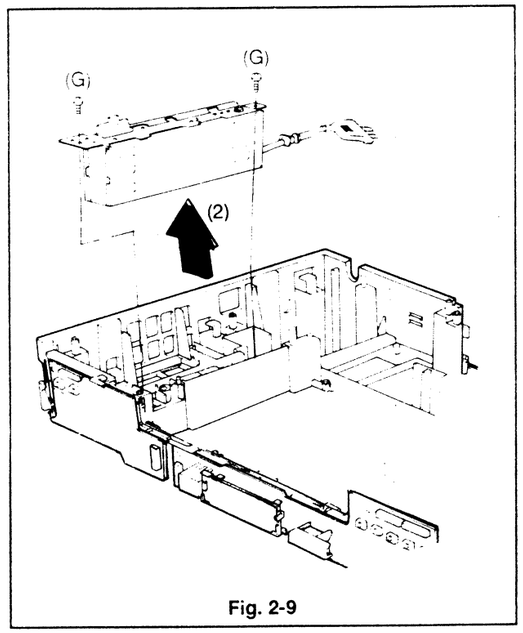


Fig. 2-9

7. BS Circuit Board

A. Remove the Main (1) Circuit Board (See Fig. 2-5)
B. Release 3 screws (H) (See Fig. 2-10)

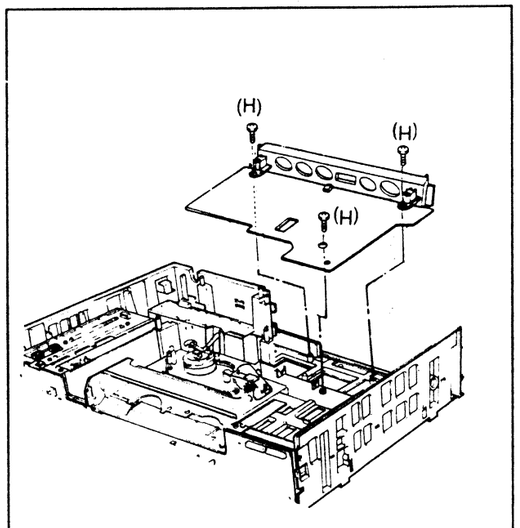
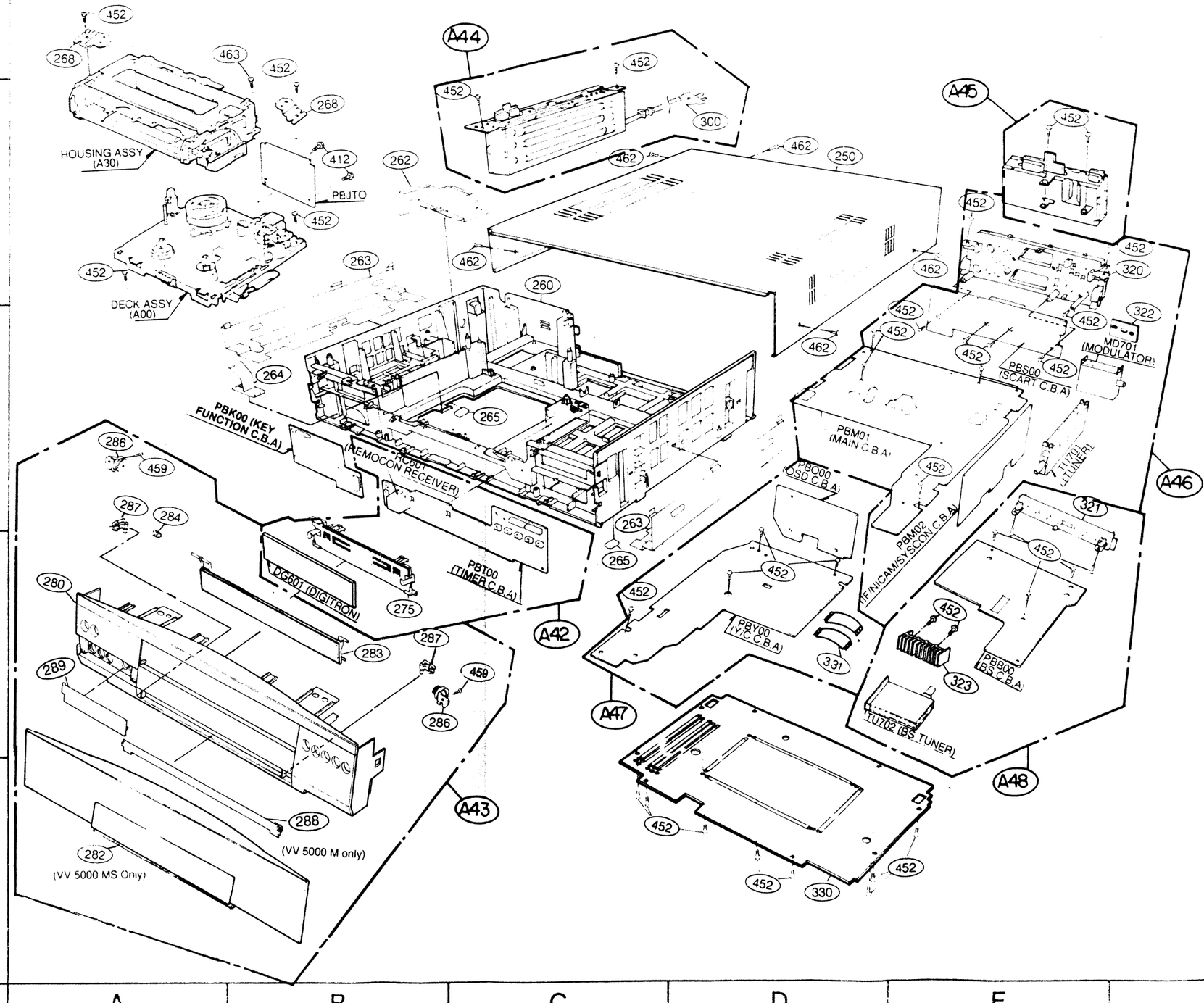


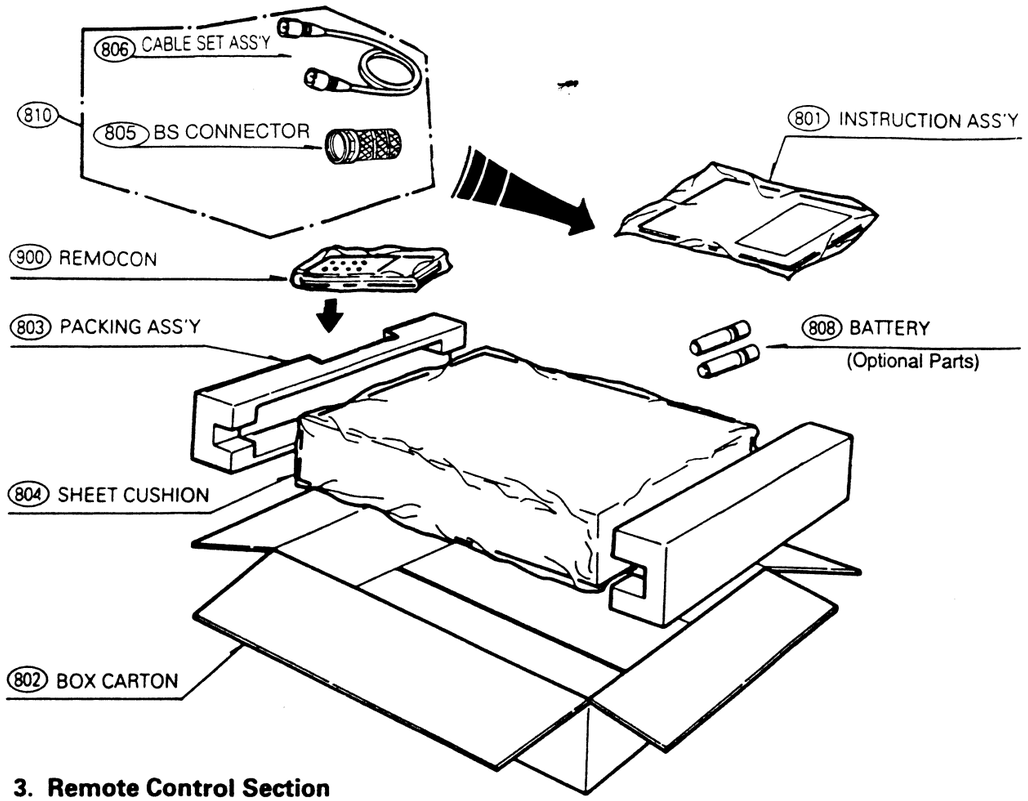
Fig. 2-10

EXPLODED VIEWS

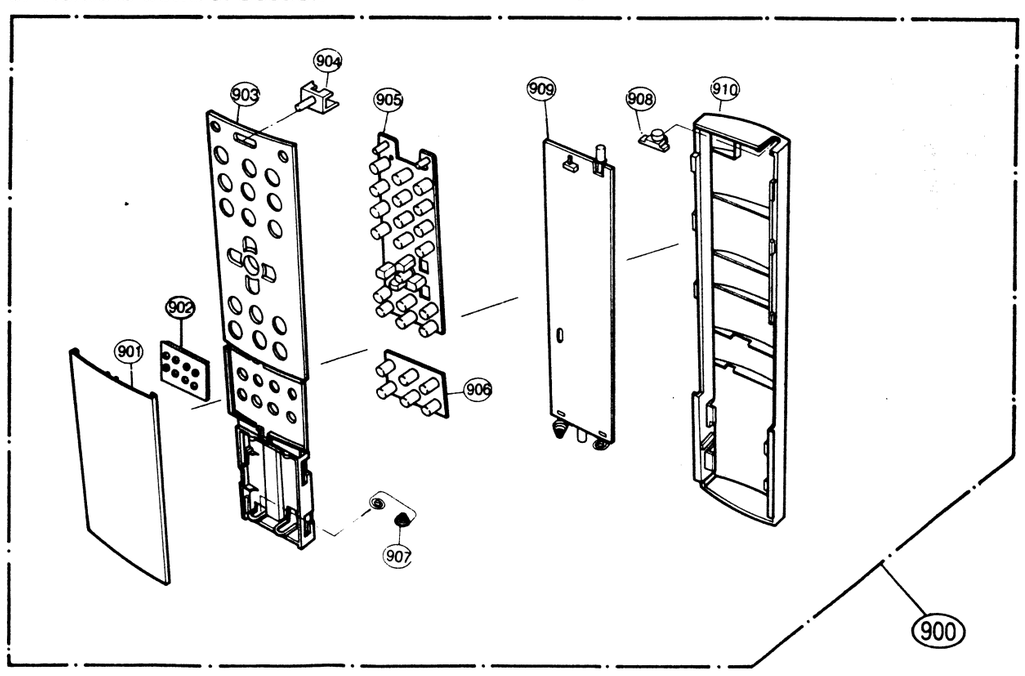
1. Cabinet & Main Frame Section



2. Packing Accessory Section



3. Remote Control Section



MEMO

SECTION 3 ELECTRICAL
ELECTRICAL ADJUSTMENT PROCEDURES

Electronic Test Equipment Requirement:

- Oscilloscope
- Video Signal Generator - PAL
- Level Meter
- + Driver
- Test Tape (SP)-PAL
- Recording Tape
- Digital Voltmeter

1. Servo Circuit

1) ±PG Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
Playback	6.5H±0.5H (416μsec, 1H=64μsec)	TP201 (H. SW) W404 (Video Out Terminal)	VR201

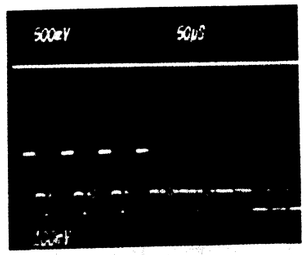
Purpose:
It is for the phase dividing of the Video A, B heads with 180° and the exact tracing of each track to meet head switching point with VHS Spec.

Procedure:
a. Playback a PAL/SP test tape.
b. At this time, the "ATR" is lighting, after pressing the PROG (+) or PROG (-) and adjust the X-Value.
c. Connect CH-1 terminal of oscilloscope to TP201 H. SW, and CH-2 terminal to video out terminal (W404) of VCR.
d. Trigger the complex Video signal of CH-2 to CH-1 H.SW, and adjust VR201 so that the distance from A(B) head selection point of H.SW signal to the starting point of horizontal synchronized signal is 6.5H (416μsec, 1H=64μsec).

Reference)
1. ±PG adjustment is practiced in the state of maximum RF level and locked servo system. (MTR Mode.)
2. The deviation between A/B Head Adjustment location should be within ±0.5H (32μsec).
3. The deviation between the specification of adjustment and the practical measurement value should be within ±0.5H (32μsec).
4. Oscilloscope and VCR set should be connected with GND.

Waveform

Composite Video Signal



6.5H (416μsec)
H.SW (TP201)

Fig. 3-1

2. Audio Circuit

1) Record Oscillation Voltage Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
Record	2.6±0.2mV	TP451 (-), TP452 (+)	VR451

Purpose:
This is for adjusting bias voltage to specification in recording.

Procedure:
a. Connect the (-) terminal of Level Meter to TP451 (-).
b. Connect the (+) terminal of Level Meter to TP452 (+).
c. Confirm that the Oscillation Voltage is 2.6±0.2mV.
d. At this time, Adjust VR451 so that the Oscillation voltage fit to specification.

Reference:
The Set and Oscilloscope should be connected with 1:1 probe.

3. Tuner/IF Circuit

1) AFC Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
CH-11 (217.25MHz) PAL Reception	DC 2.5±0.1V	ICA01 Pin ⑮	TA01

Procedure:
a. Select the TV Programme Mode on OSD Menu.
b. Select the PAL on the TV Programme Mode.
c. Be tuning CH-11 (217.25MHz, strength of RF electrical field : 70dBμV) fine.
d. Connect the Digital Voltmeter to ICA01 Pin ⑮.
e. Adjust TA01 so that the Digital Voltmeter is DC 2.5±0.1V.

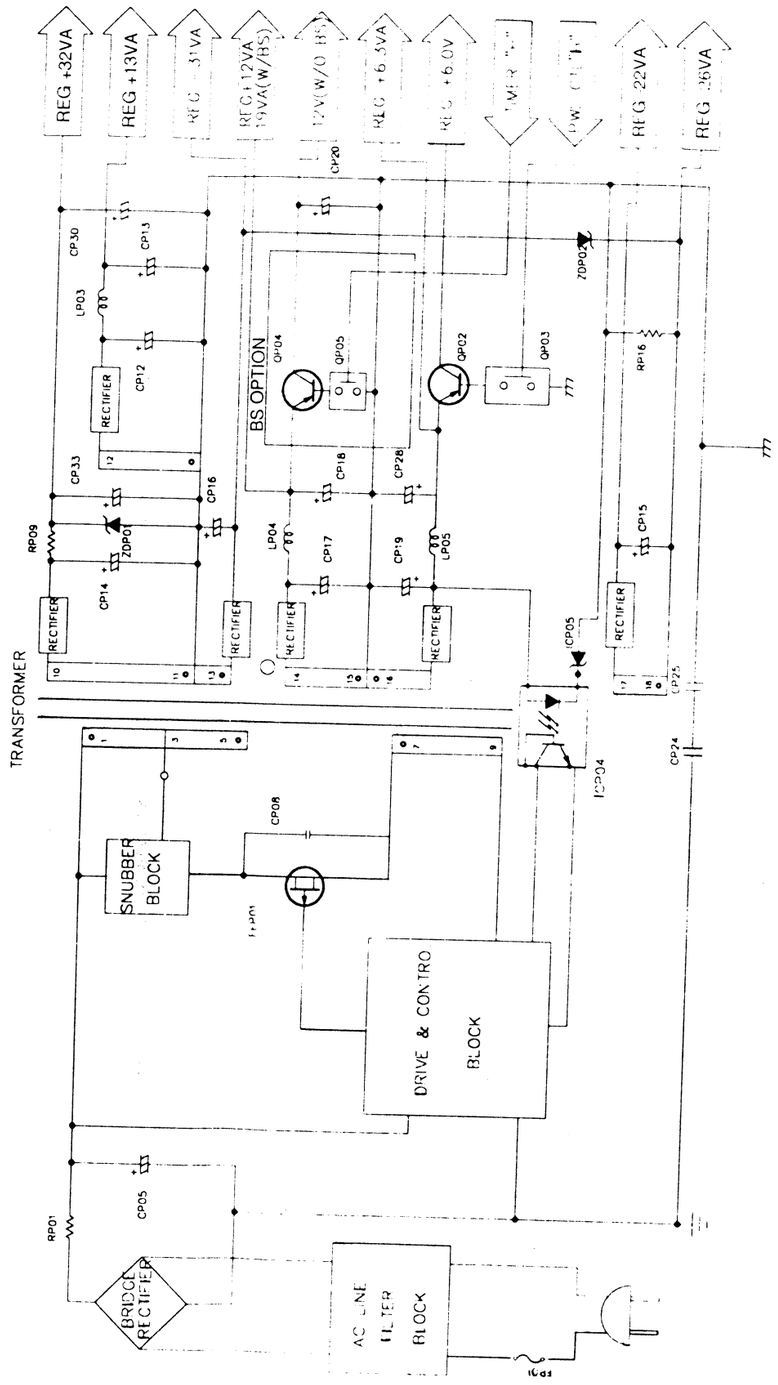
2) RF AGC Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
CH-11 (217.25MHz) Normal Reception	DC 4.8± 0.1V	TUNER AGC Terminal	VR701

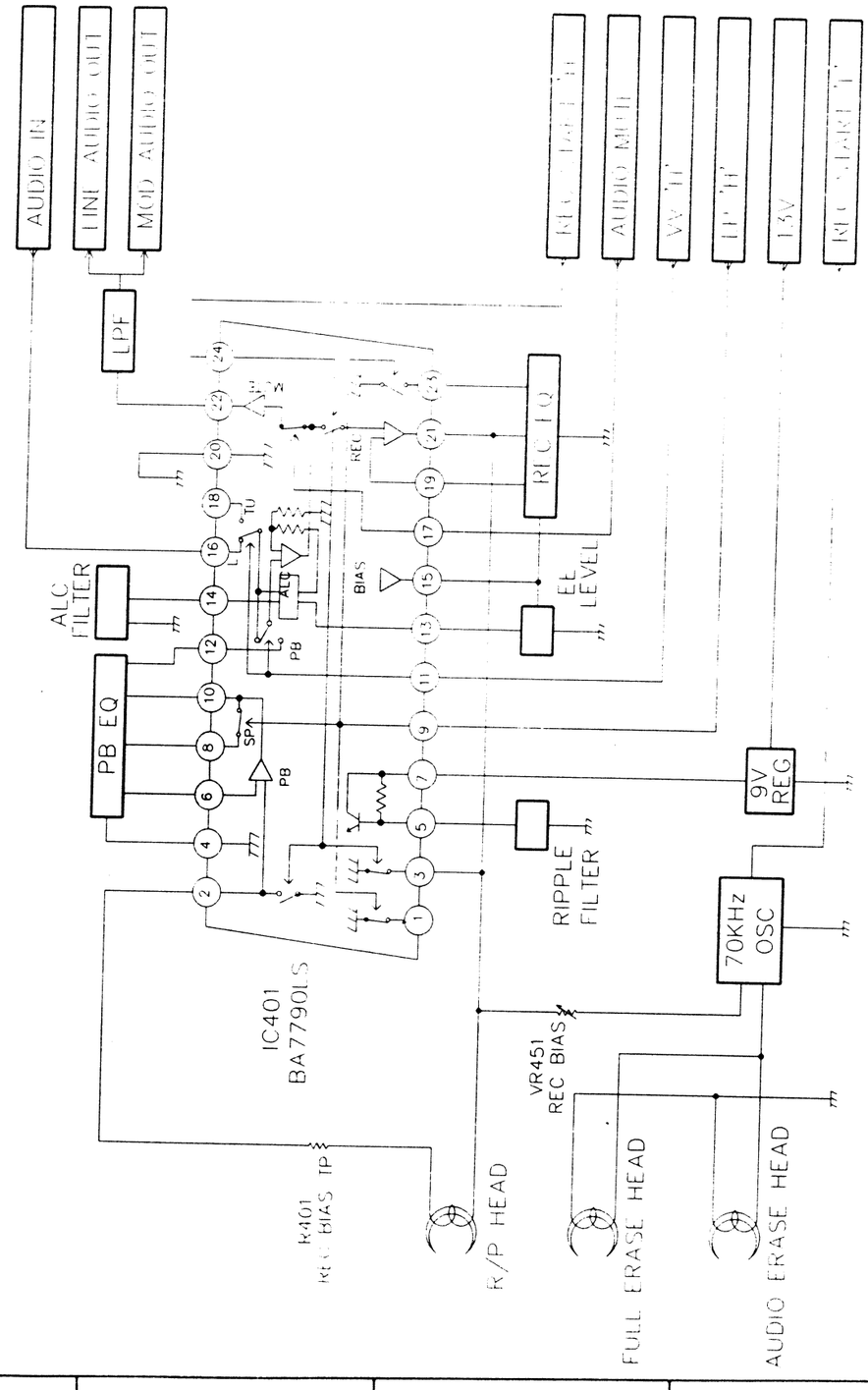
Procedure:
a. Be tuning CH-11 (217.25MHz, strength of RF electric field: 70dBμV) fine.
b. Connect the Digital Voltmeter to AGC terminal of TU701.
c. Adjust VR701 so that the Digital Voltmeter is DC 4.8±0.1V.

BLOCK DIAGRAMS

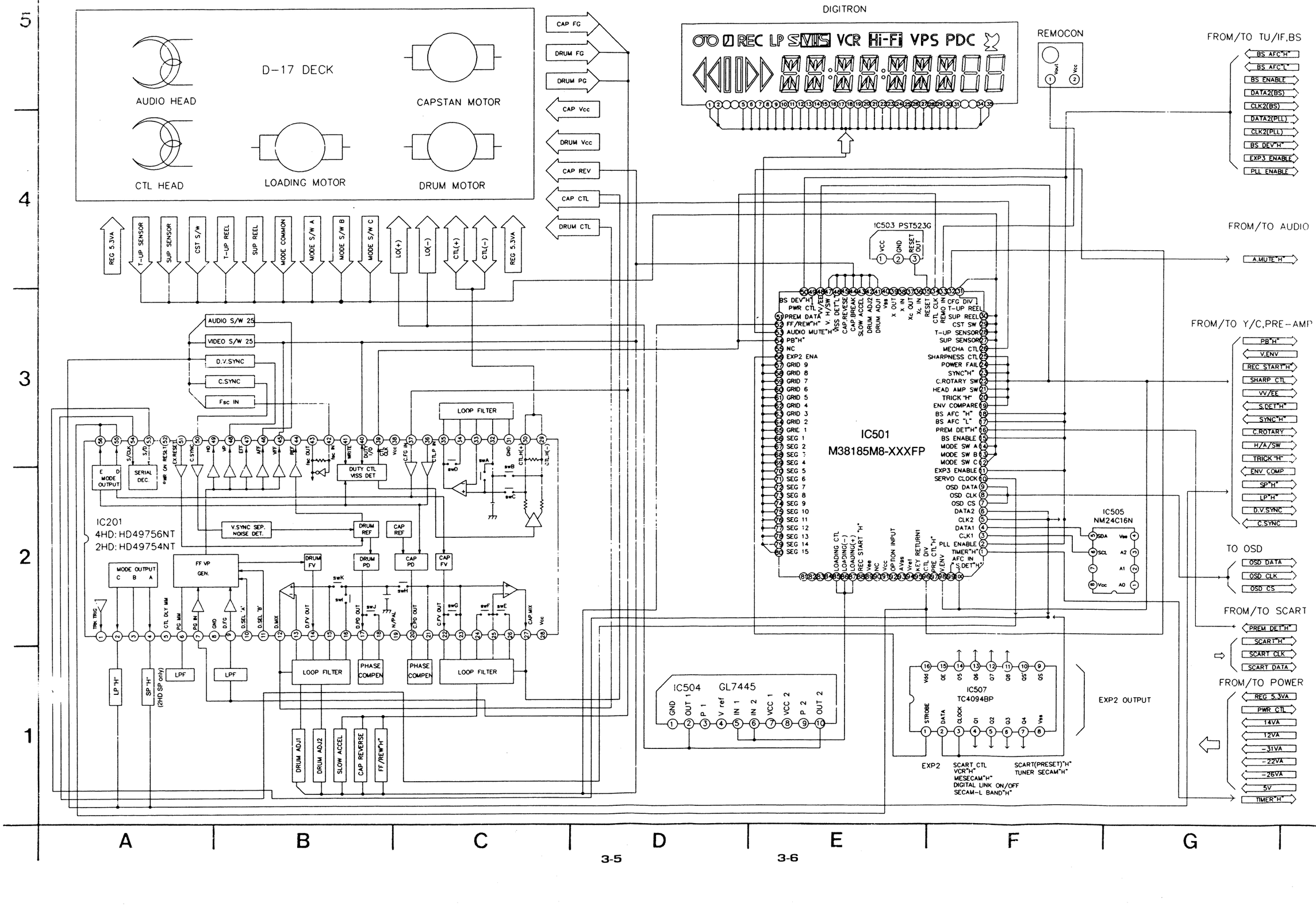
1. Power (SMPS) Block Diagram



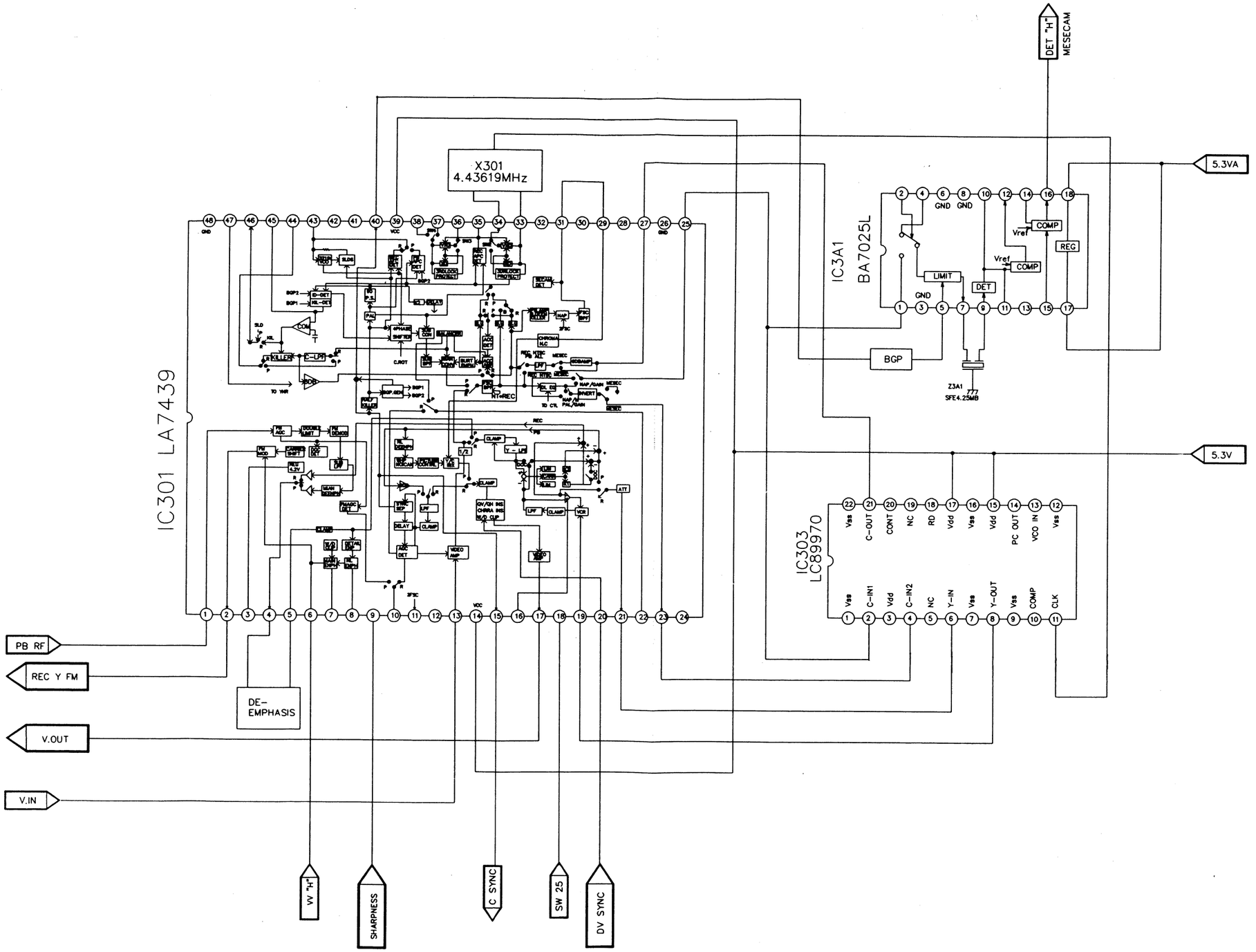
2. Audio Block Diagram



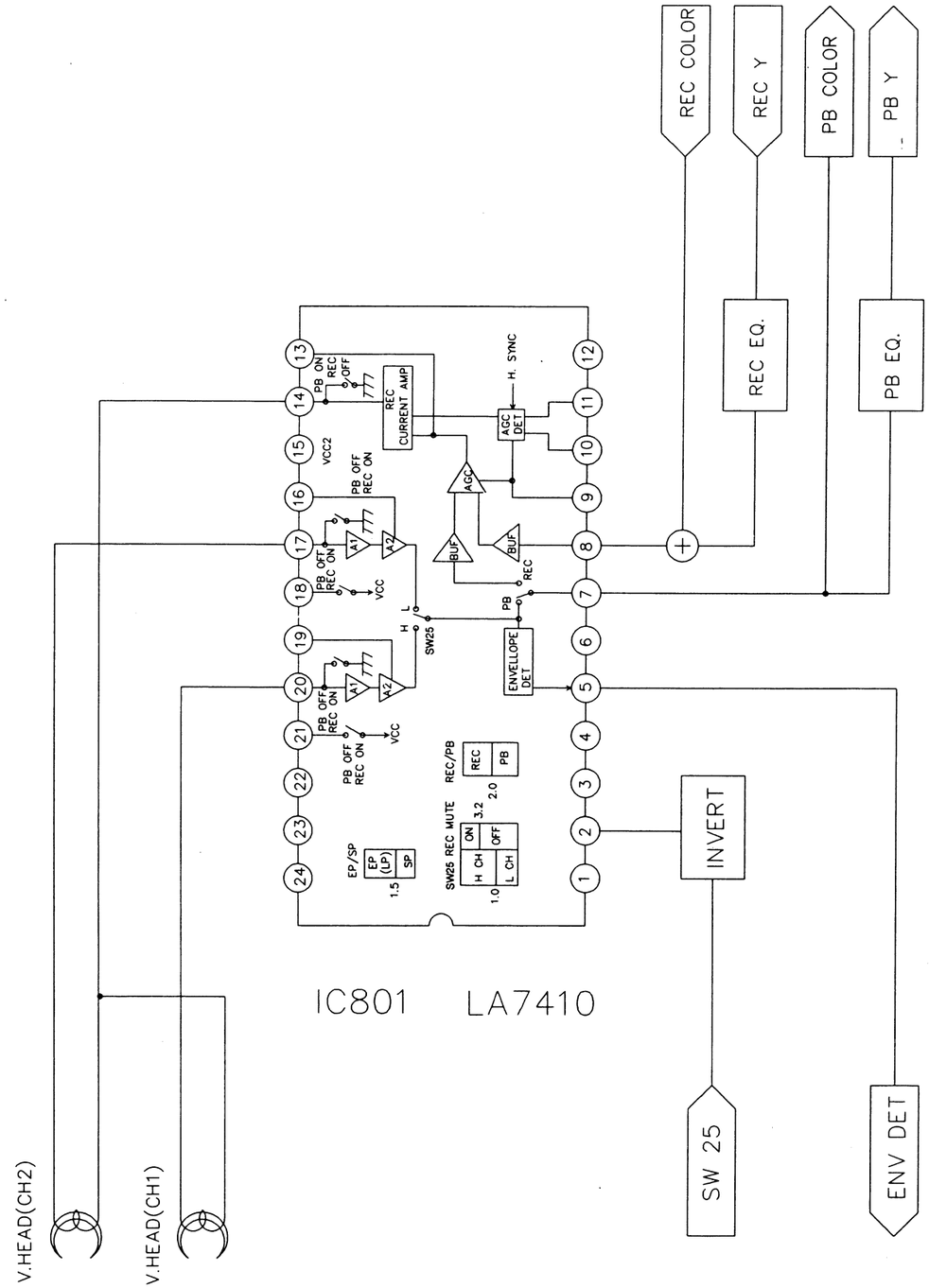
3. Servo, System Control & Timer Block Diagram



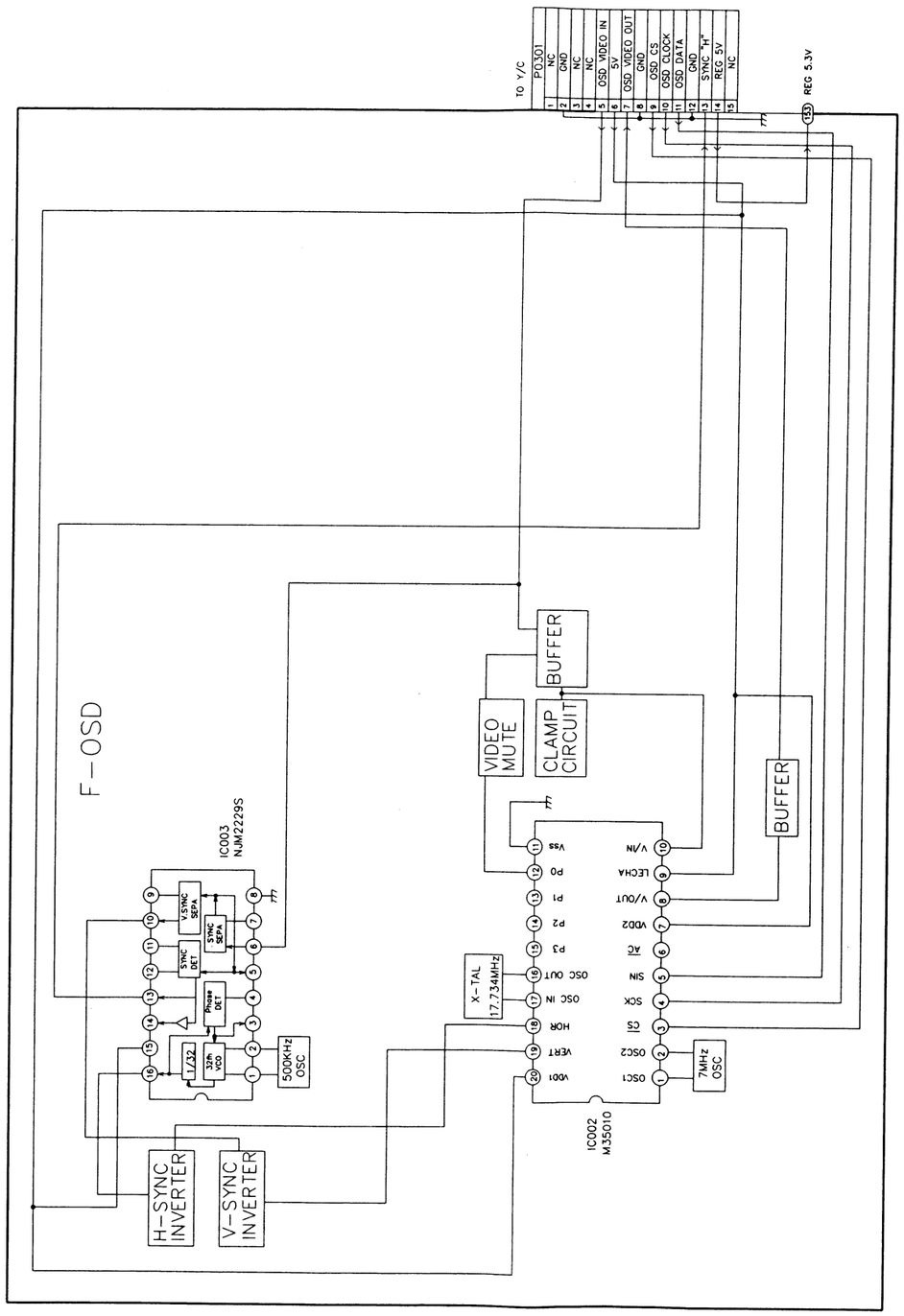
4. Y/C Block Diagram



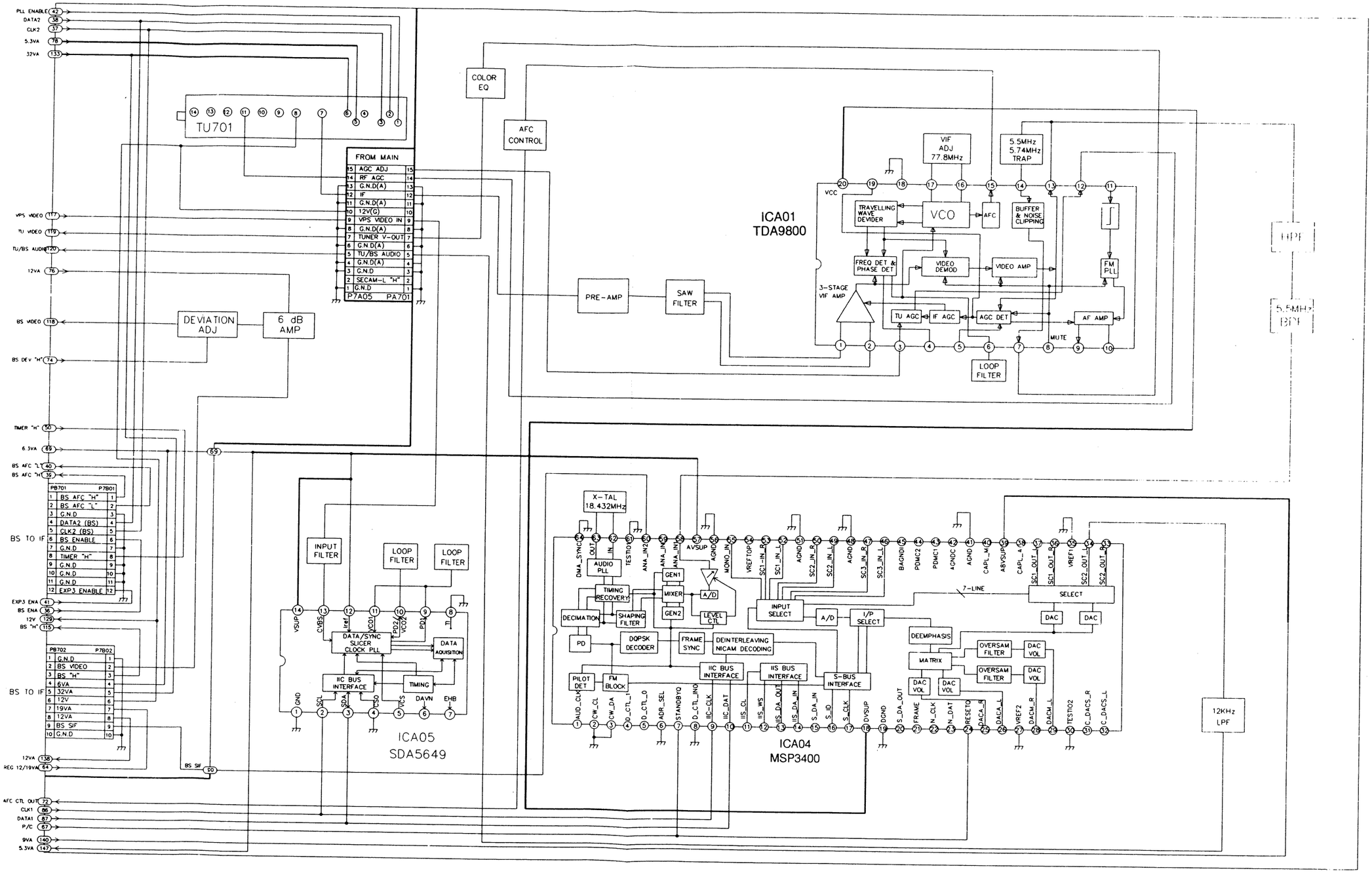
5. Pre-Amp Block Diagram



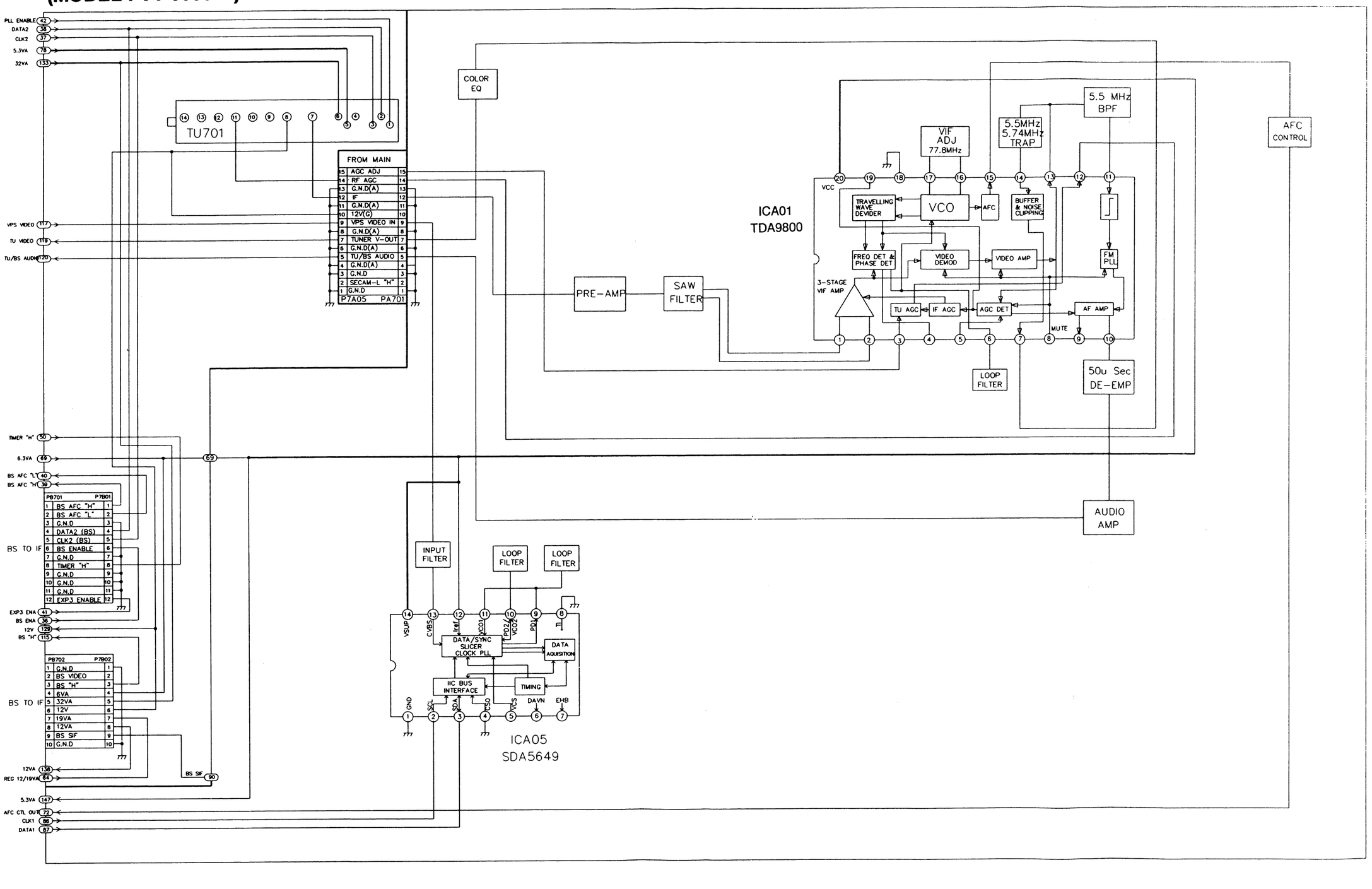
6. Function OSD Block Diagram



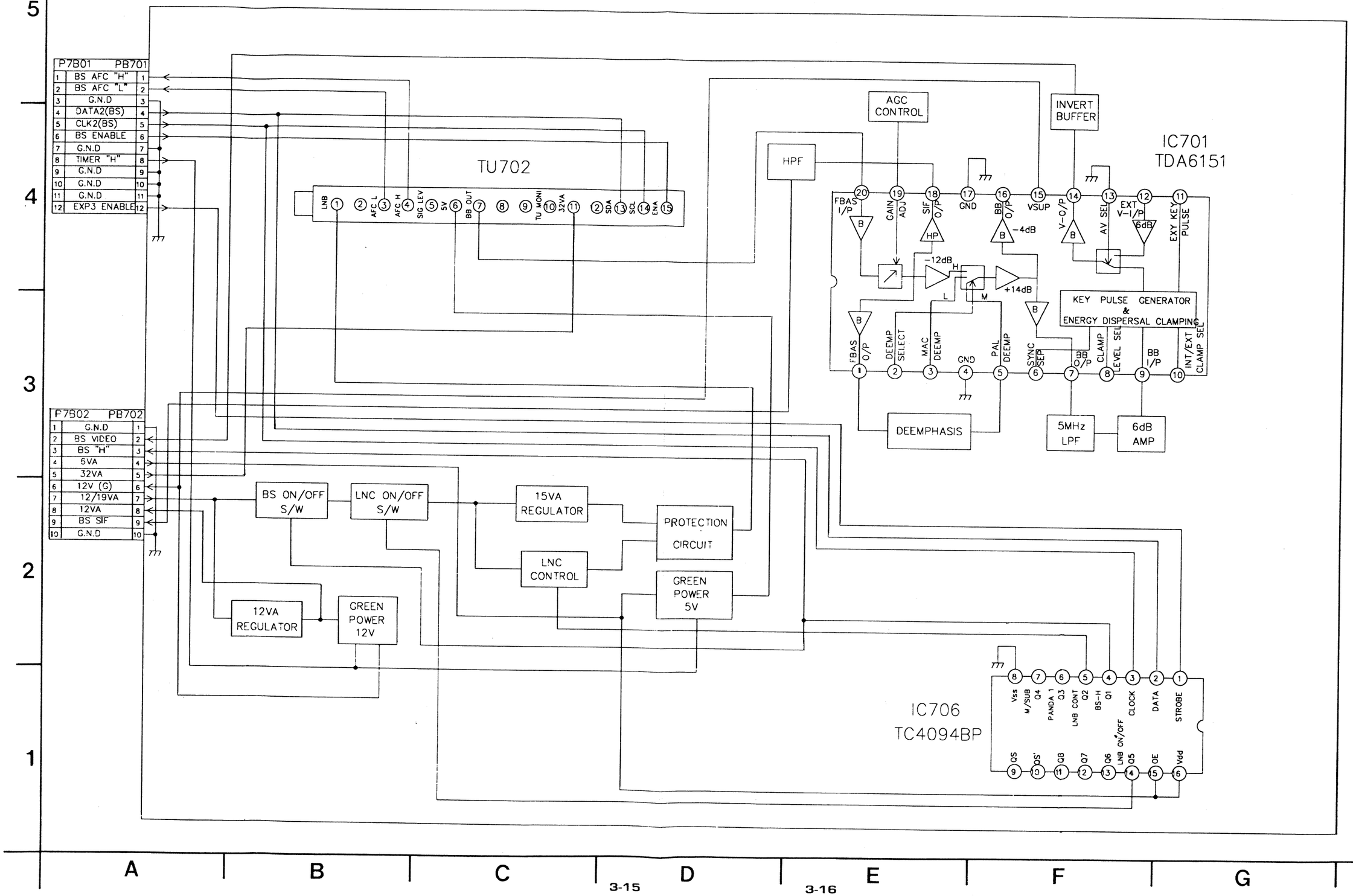
7. Tuner/IF Block Diagram
(MODEL : VV 5000 MS)



Tuner/IF Block Diagram
(MODEL : VV 5000 M)



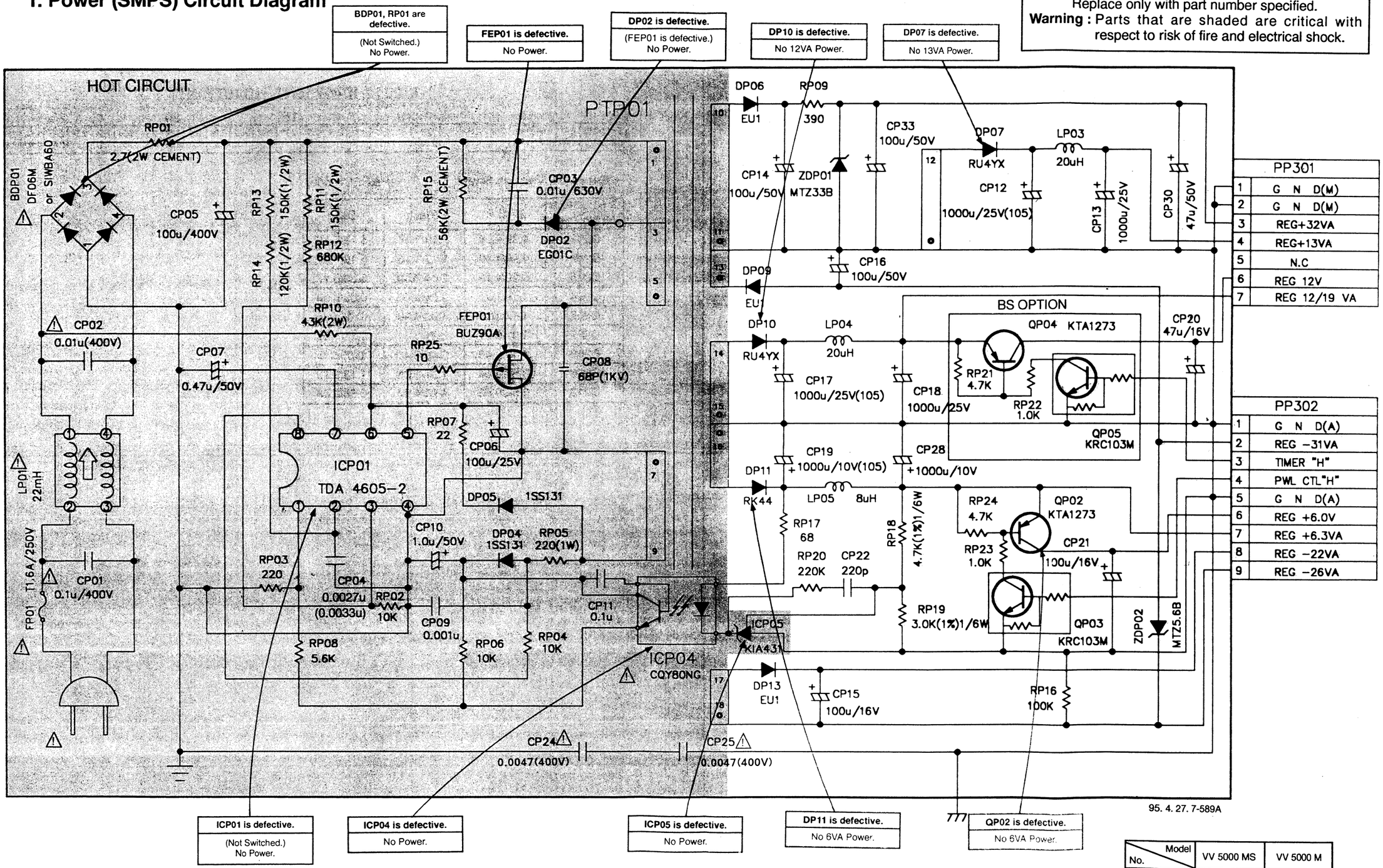
8. BS Block Diagram (Model : Only for VV 5000 MS)



CIRCUIT DIAGRAMS

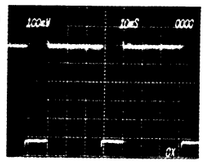
1. Power (SMPS) Circuit Diagram

Note : The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.
Warning : Parts that are shaded are critical with respect to risk of fire and electrical shock.

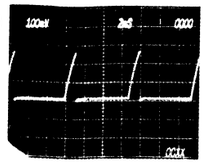


No. \ Model	VV 5000 MS	VV 5000 M
CP04	0.0033μ	0.0027μ

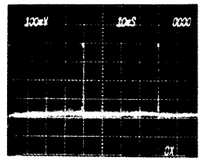
* Servo Waveform

① 

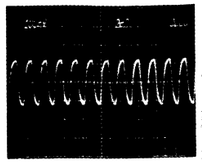
IC201 Pin ①
Tracking Trigger
(100mV/10msec)

② 

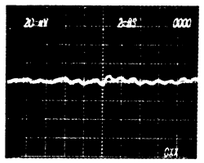
IC201 Pin ⑥
PG Mono-Multi
(100mV/2msec)

③ 

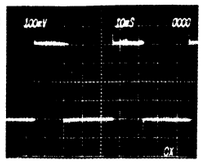
IC201 Pin ⑦ PG Input
(100mV/10msec)

④ 

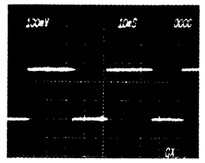
IC201 Pin ⑨ Drum
Frequency Generator
Input (100mV/2msec)

⑤ 

IC201 Pin ㉗ Capstan Control
(20mV/2msec)

⑥ 

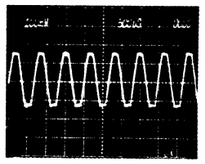
IC201 Pin ㉙
Record Control (-)
(100mV/10msec)

⑦ 

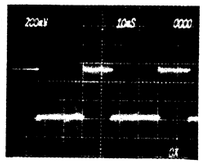
IC201 Pin ㉚
Record Control (+)
(100mV/10msec)

⑧

IC201 Pin ㉟
Playback Control Pulse
(50mV/10msec)

⑨ 

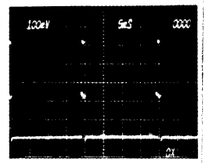
IC201 Pin ㊲
Capstan Frequency Generator
Input (100mV/500μ sec)

⑩ 

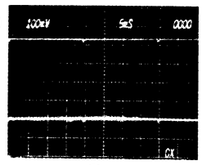
IC201 Pin ㊴ Control Clock
(200mV/10msec)

⑪

IC201 Pin ㊺
Video Head Switching
Pulse (100mV/10msec)

⑫ 

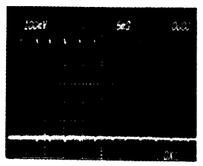
IC201 Pin ㊽ Vertical Pulse (VP)
(100mV/5msec)

⑬ 

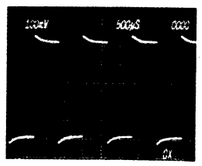
IC201 Pin ㊿ C-SYNC
Input terminal
(100mV/5msec)

⑭

IC201 Pin ㊸
Servo Data Input terminal

⑮ 

IC201 PIN ㊹ Servo Clock Input
terminal (100mV/5msec)

⑯ 

IC201 Pin ㊺ CFG (Capstan
Frequency Generator) Count
Down Output terminal
(100mV/500μ sec)

⑰

IC201 Pin ㊻ Control Count Down
Output terminal.
(100mV/10msec)

* Servo IC Voltage Sheet

PB (REC)

1.99 (4.97)	2.51 (2.49)	0.88 (0.88)	1.23 (1.29)	3.73 (3.70)	5.01 (4.99)	0.50 (0.46)	0.02 (0.01)	0.05 (0.05)	2.50 (2.50)	2.50 (0.02)	2.50 (2.48)	2.56 (2.57)	2.56 (2.55)	2.54 (2.53)	0.00 (0.0)	5.00 (4.97)	2.00 (3.59)	5.02 (4.99)	2.62 (2.60)	2.51 (2.49)	2.51 (2.49)	2.51 (2.49)	2.51 (2.49)	2.51 (2.49)	0.00 (0.0)	2.51 (2.74)	2.51 (2.10)
55						50					45					40				35						30		

IC201 (HD49756NT, HD49754NT)

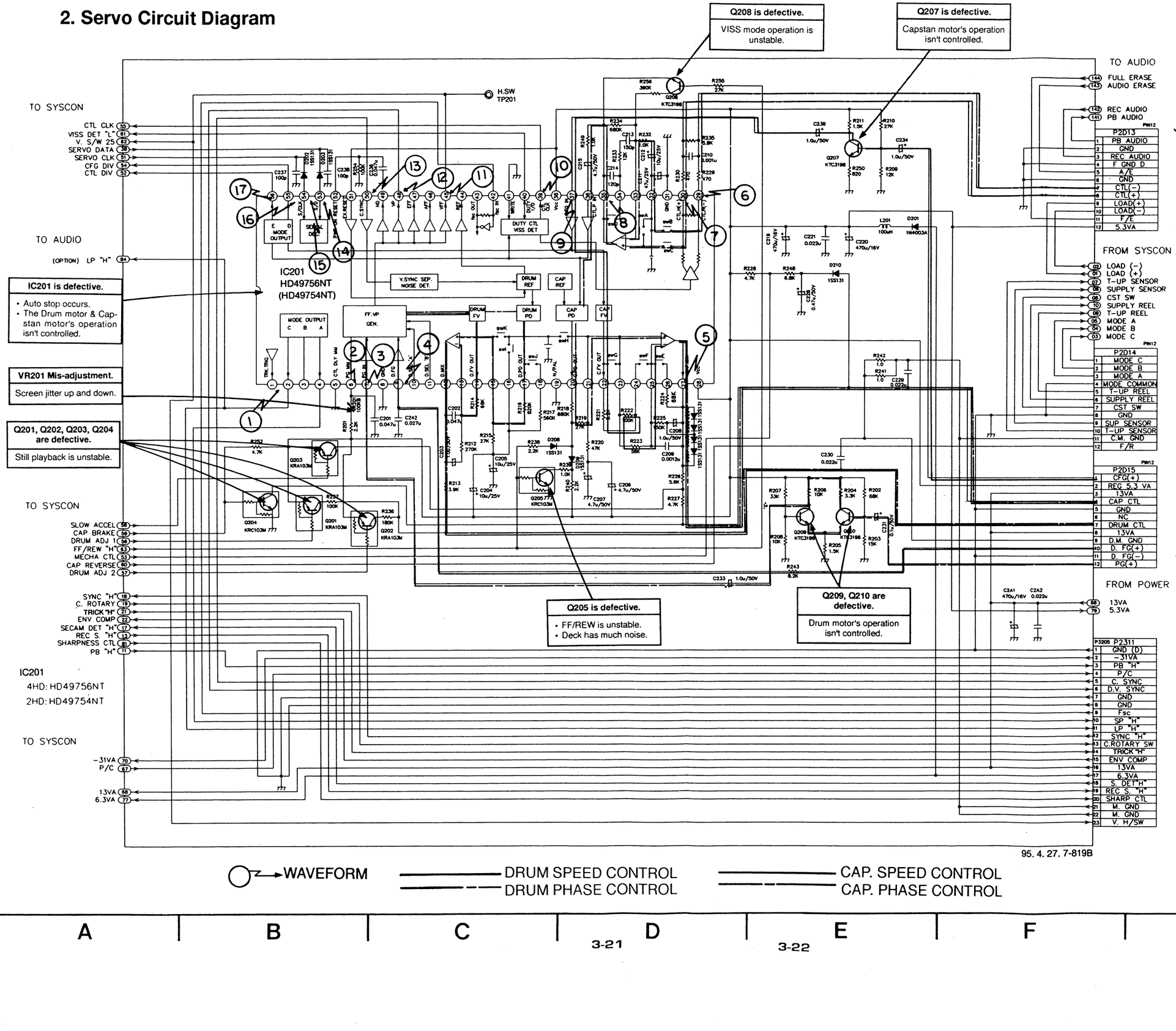
1				5				10				15				20				25							
3.61 (3.60)	0.02 (0.02)	0.01 (0.01)	4.99 (4.95)	0.0 (0.0)	0.30 (0.30)	2.11 (2.10)	0.0 (0.0)	2.60 (2.59)	2.61 (2.6)	2.62 (2.6)	1.31 (1.29)	2.51 (2.49)	2.53 (2.51)	2.52 (2.51)	2.52 (2.50)	2.52 (2.53)	2.39 (2.37)	0.0 (0.0)	2.54 (2.52)	2.53 (2.51)	2.54 (2.51)	2.54 (2.51)	2.54 (2.51)	2.52 (2.51)	2.64 (2.60)	2.66 (2.63)	5.03 (4.99)

* Servo TR Voltage Sheet

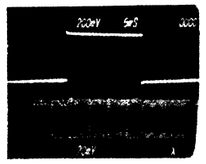
(PB/REC mode)

Port / TR No.	Emitter	Collector	Base
Q201	4.99/4.98	1.18/1.17	5.19/5.16
Q202	4.99/4.99	1.17/1.16	5.19/5.16
Q203	4.99/4.99	2.64/2.63	5.20/5.17
Q204	0.00/0.0	2.64/2.63	0.03/0.03
Q205	0.00/0.0	4.99/4.98	0.00/0.0
Q207	0.91/0.91	3.35/3.34	1.51/1.51
Q208	2.49/2.49	2.40/2.40	0.00/0.0
Q209	0.54/0.54	1.27/1.25	1.13/1.13
Q210	0.54/0.55	4.98/4.97	0.88/0.88

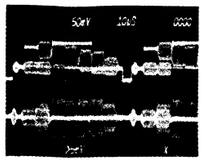
2. Servo Circuit Diagram



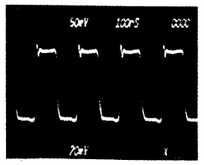
* Y/C Waveform (When taking a photograph of waveform, set probe of oscilloscope to 10:1)

① 

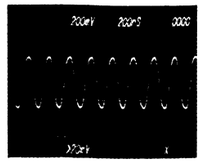
IC301 Pin ①
Playback RF (SP mode)
(20mV/5msec)

② 

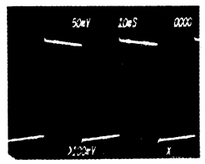
IC301 Pin ㉕
Playback Color
(5mV/10μ sec)

③ 

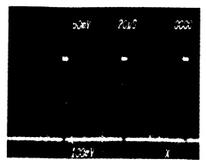
IC301 Pin ㉞
Playback Mode : Fsc
Oscillation (20mV/100nsec)

③ 

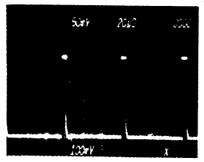
IC301 Pin ㉞
Record Mode:Fsc
Oscillation (20mV/200nsec)

④ 

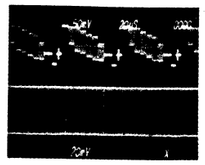
IC303 Pin ⑱
S/W 25 (100mV/10msec)

⑤ 

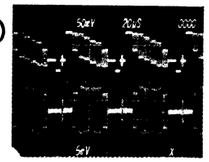
IC301 Pin ⑮ C.SYNC
(100mV/20μ sec)

⑥ 

IC301 Pin ㊵
B.G.P Out terminal
(100mV/20μ sec)

⑦ 

IC301 Pin ②
Record FM signal
(20mV/20μ sec)

⑧ 

IC303 Pin ④
Record Color Signal
(5mV/20μ sec)

* Y/C TR Voltage Sheet (PB/REC mode)

Port / TR No.	Emitter	Collector	Base
Q305	3.45/2.91	0.0/0.0	2.86/2.32
Q309	3.47/0.0	6.0/0.0	4.09/0.0
Q312	0.0/0.0	0.01/6.07	3.62/0.0
Q313	6.12/6.08	6.05/0.0	5.32/6.08
Q314	2.23/2.34	5.18/5.15	2.82/2.93
Q323	0.93/0.0	4.28/0.0	1.54/0.0
Q324	5.46/5.46	12.87/12.89	6.04/6.04
Q325	3.19/0.64	0.0/0.0	2.56/0.0
Q326	0.0/0.0	0.0/0.0	4.77/4.77
Q327	0.0/0.0	0.0/0.0	0.09/0.10
Q3A1	0.0/0.0	4.94/4.91	0.05/0.04
Q3A2	0.0/0.0	0.0/2.30	5.15/0.0
Q3A3	option		

* Y/C IC Voltage Sheet

PB (REC)

0.00 (0.0)	1.60 (1.74)	0.00 (0.01)	2.06 (2.05)	3.36 (2.49)	3.05 (3.02)	3.94 (3.02)	0.00 (0.0)	0.50 (0.49)	5.18 (5.15)	0.00 (0.0)	0.00 (0.0)	0.00 (0.0)	2.03 (2.05)	2.83 (2.96)	4.09 (4.09)	0.20 (0.19)	2.63 (0.02)	0.08 (0.06)	1.96 (1.94)	0.11 (0.1)	2.61 (2.58)	0.00 (0.0)	2.66 (2.64)
			45				40						35					30					25
IC301 (LA7439)																							
1				5					10						15					20			24
3.69 (3.07)	3.77 (3.10)	4.21 (4.20)	2.88 (2.31)	3.12 (2.99)	4.66 (2.26)	4.66 (2.26)	3.25 (3.24)	2.55 (2.53)	1.68 (1.44)	2.09 (2.08)	2.69 (2.68)	3.93 (3.02)	5.16 (5.15)	0.50 (0.47)	3.14 (3.14)	1.79 (1.98)	2.26 (2.28)	2.17 (2.16)	0.05 (0.05)	1.11 (1.14)	2.14 (2.25)	2.61 (2.59)	0.18 (0.17)

PB (REC)

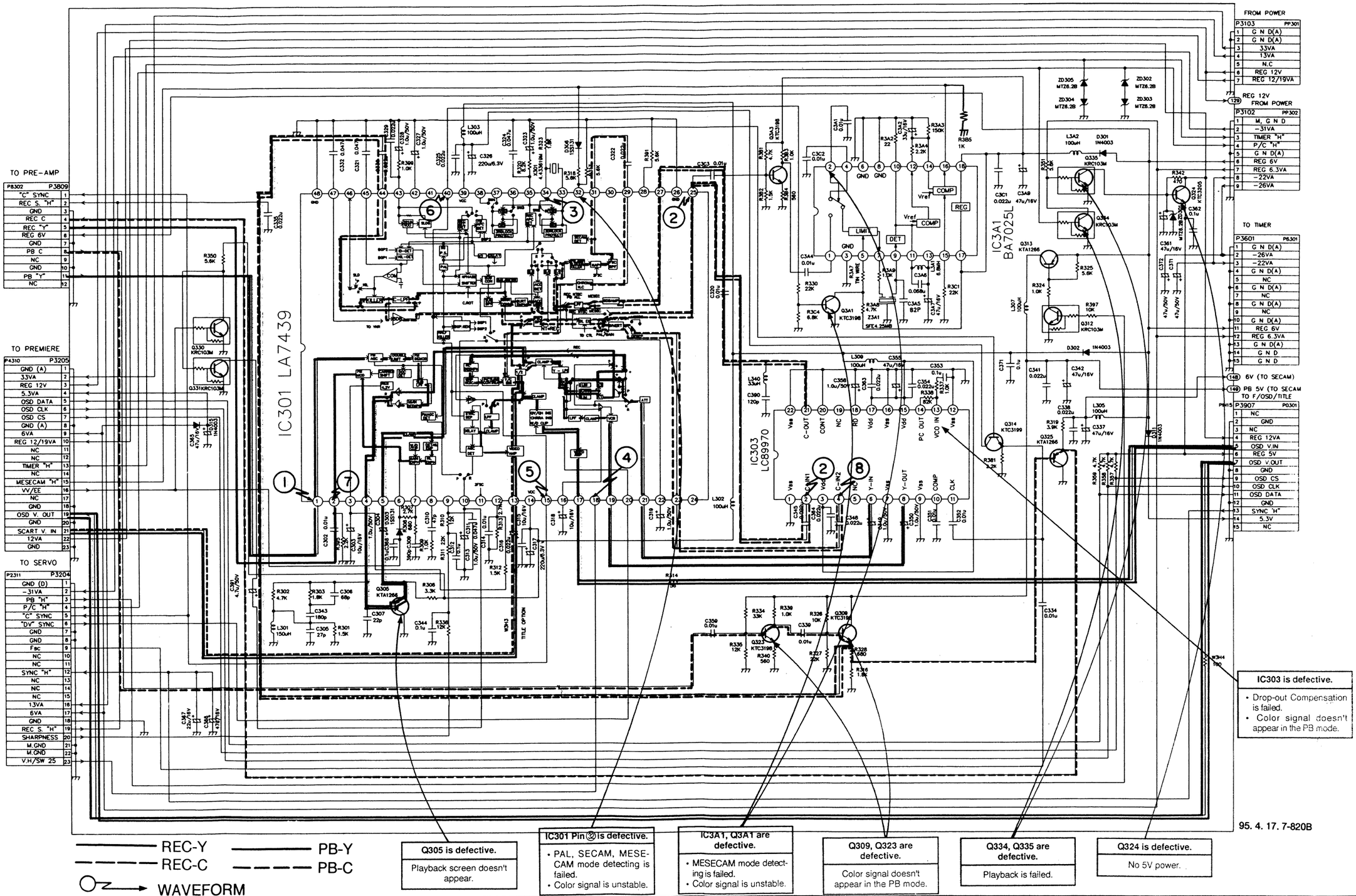
0.0 (0.0)	1.30 (1.29)	0.0 (0.0)	5.14 (5.10)	8.96 (8.84)	5.24 (5.20)	0.0 (0.0)	5.24 (5.20)	1.97 (2.02)	1.97 (2.02)	0.0 (0.0)
		20				15				
IC303 (LC89970)										
1			5						10	
0.0 (0.0)	2.33 (2.29)	5.24 (5.20)	2.33 (2.29)	0.0 (0.0)	2.27 (2.31)	0.0 (0.0)	1.07 (1.12)	0.0 (0.0)	2.31 (2.29)	1.14 (1.12)

PB (REC)

0.0 (1.27)	4.06 (4.04)	0.0 (0.0)	0.00 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	5.46 (5.42)
				10				
IC3A1 (BA7025L)								
1			5					15
4.06 (4.04)	0.0 (0.0)	4.95 (4.91)	4.85 (4.81)	3.27 (3.23)	4.0 (4.25)	4.0 (4.24)	0.0 (0.0)	5.46 (5.42)

* IC301 (LA7439) Block Diagram

3. Y/C Circuit Diagram

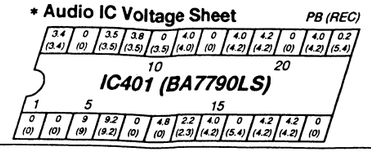


4. Audio Circuit Diagram

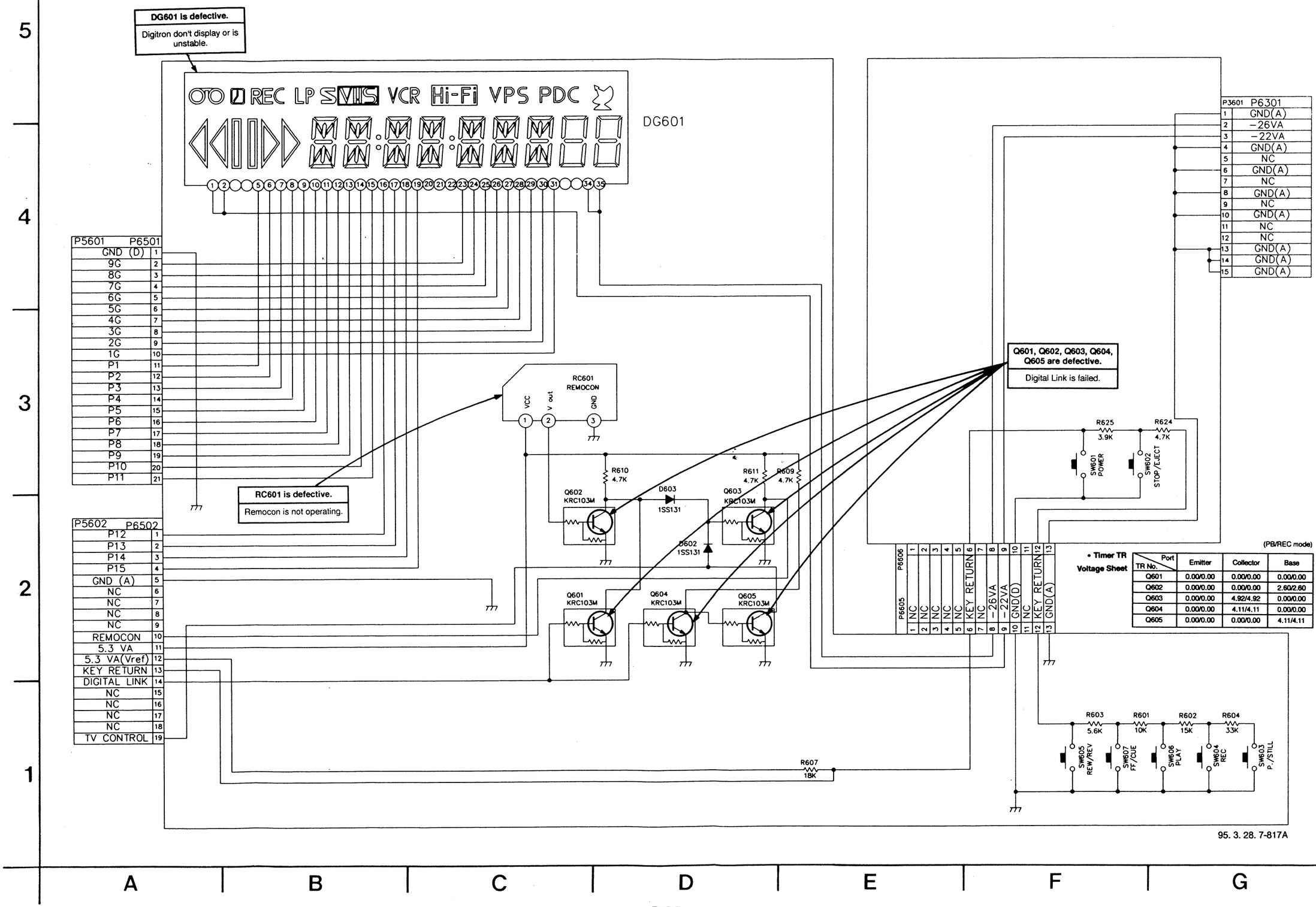
• Audio TR Voltage Sheet (PB/REC mode)

TR No. \ Port	Emitter	Collector	Base
Q401	0/0.6	9.2/9.0	0/0.5
Q402	0/0	0/0.5	6.3/0
Q405	0/0	6.3/0	0.2/5.3
Q407	9.3/9.3	12.0/12.0	12.0/9.6

*** Audio IC Voltage Sheet** *PB (REC)*



5. Timer Circuit Diagram



• Timer TR Voltage Sheet (PB/REC mode)

TR No. \ Port	Emitter	Collector	Base
Q601	0.00/0.00	0.00/0.00	0.00/0.00
Q602	0.00/0.00	0.00/0.00	2.60/2.60
Q603	0.00/0.00	4.92/4.92	0.00/0.00
Q604	0.00/0.00	4.11/4.11	0.00/0.00
Q605	0.00/0.00	0.00/0.00	4.11/4.11

MEMO

* System Control TR Voltage Sheet (PB/REC mode)

Port / TR No.	Emitter	Collector	Base
Q501	0.00/0.00	0.00/0.00	5.21/5.21
Q502	0.00/0.00	pulse	pulse
Q505	0.00/0.00	0.00/0.00	0.00/0.00
Q506	0.00/0.00	2.22/2.22	0.37/0.37
Q507	2.83/1.88	2.82/1.88	2.24/1.29
Q550	0.00/0.00	0.06/0.06	4.36/4.36
Q551	12.90/12.90	12.89/12.89	12.13/12.13
Q552	11.94/11.94	0.00/0.00	12.35/12.35
Q553	0.00/0.00	0.62/0.62	0.00/0.00
Q554	4.93/4.93	0.00/0.00	4.88/4.88
Q555	0.00/0.00	0.02/0.02	4.85/4.85

* System Control IC Voltage Sheet

PB (REC)

IC503 (PST523G)

1

5.26 (5.22)	0.00 (0.0)	5.26 (5.22)

PB (REC)

IC504 (GL7445)

1 5 10

0.00 (0.16)	0.52 (0.50)	0.77 (0.78)	0.48 (0.72)	1.76 (1.77)	1.77 (1.77)	12.62 12.61	12.62 12.62	0.78 (0.79)	0.52 (0.5)

PB

IC505 (NM24C16N)

1 5

4.95	0.0	0.21	0.13
0.0	0.0	0.0	0.0

PB (REC)

IC507 (TC4094BP)

1 5 10 15

4.95 (4.94)	4.95 (4.94)	4.95 (4.95)	4.89 (4.88)	0.00 (0.0)	0.00 (0.0)	1.17 (2.76)	1.17 (2.73)
0.00 (0.0)	0.73 (0.83)	0.73 (0.71)	4.87 (4.86)	0.00 (0.0)	0.00 (0.0)	0.00 (0.0)	0.00 (0.0)

PB (REC)

IC501 (M38185M8)

	0.00 (0.0)	0.00 (5.15)	0.00 (0.0)	2.50 (2.51)	4.99 (4.97)	0.00 (0.0)	0.03 (0.03)	5.22 (5.17)	5.22 (5.17)	5.22 (5.17)	0.00 (0.0)	2.53 (2.51)	2.39 (2.37)	2.59 (2.58)	2.36 (2.34)	5.26 (5.22)	2.00 (3.62)	4.96 (4.91)	2.50 (2.50)	pulse (pulse)	
pulse (pulse)	50					45				40					35					30	pulse (pulse)
0.00 (0.0)																					4.99 (0.0)
0.00 (0.0)																					0.02 (0.03)
5.23 (0.0)																					0.06 (0.0)
0.00 (0.00)	55																				5.25 (5.21)
0.00 (0.0)																					2.60 (2.63)
-27.6 (-27.6)																					4.09 (4.08)
-27.6 (-27.5)																					4.75 (4.72)
0.00 (-27.5)																					0.05 (0.05)
-27.6 (-27.5)	60																				0.05 (0.05)
-27.6 (-27.5)																					0.05 (0.05)
-27.6 (-27.6)																					0.49 (0.14)
-27.6 (-27.6)																					4.52 (4.52)
-27.6 (-27.6)																					0.28 (0.28)
-27.6 (-27.5)	65																				0.00 (0.0)
-24.0 (-13.5)																					0.50 (0.49)
-31.0 (-27.5)																					0.50 (0.0)
-31.0 (-27.5)																					0.00 (0.0)
-31.0 (-27.5)																					0.00 (0.0)
-31.0 (-20.4)	70																				0.12 (0.12)
-24.0 (-13.5)																					0.33 (0.34)
-17.1 (-24.0)																					5.45 (5.42)
-17.1 (-17.1)																					5.42 (5.39)
-31.0 (-17.0)																					4.00 (0.0)
-31.0 (-24.0)	75																				0.70 (0.0)
-31.0 (-31.0)																					0.00 (0.0)
-31.0 (-31.0)																					0.13 (0.17)
-31.0 (-31.0)																					0.17 (0.17)
-31.0 (-20.5)																					0.34 (0.0)
-20.5 (-23.9)	80					85				90					95					100	1
	-0.00 (0.0)	-0.00 (0.0)	0.00 (0.0)	0.00 (0.0)	5.25 (5.20)	5.25 (5.20)	5.25 (5.20)	0.36 (0.0)	-31.0 (-31.0)	0.50 (0.5)	5.27 (5.22)	2.15 (0.0)	-0.00 (0.0)	5.54 (5.52)	5.53 (5.21)	1.97 (4.97)	0.00 (0.00)	2.96 (1.87)	2.41 (1.27)	0.00 (0.0)	

PB

IC506 (GD4066B)

1 5 10

4.95	0.02	0.02	0.13	0.11	0.14	0.14
0.32	0.09	0.32	0.32	4.87	4.87	0.00

6. System Control Circuit Diagram

X501 is defective.
System control is unstable.

X502 is defective.
Clock doesn't operate.

IC503 is defective.
Reset doesn't operate.

Q507 is defective.
Auto tracking is unstable.

Q506 is defective.
Sharpness control is failed.

IC507 is defective.
SECAM mode, TV/VTR mode, SCART control, digital Link control are unstable.

IC501 is defective.
VCR operation is all failed.

IC505 is defective.
Memory of CH is unstable.

* OPTION LIST *

	A	B	C	D	E	etc
D5A1	O	O	O			VPS(PDC)
D5A2	O	O	O			MONO
D5A3	X	O	O			2HD
D5A4	X	O	O			sp only
D5A5	X	X	O			W/O BS
D5A6	X	X	X			ACSS plus
D5A7	O	O	O			LOEWE
D5A8	O	X	X			SECAM
D5A9	X	X	X			NICAM
D5B1	X	X	X			G2 Only
D5B2	X	X	O			DIMMER
D5B3	X	X	X			TEST
D5B4	X	X	X			TEST
D5B5	X	X	X			TEST

A; W5075MS B; W5000MS C; VV5000M

IC501
M38185M8-XXXFP

IC503 PST523G

IC504 GL7445

IC506
GD4066B

IC507
TC4094BP

IF BOARD

IC504 is defective.
Tape loading or unloading is failed.

Q502, Q503 are defective.
- Auto stop.
- Tape remain function is failed.

Q501 is defective.
Tape isn't loaded.

* CLK1 / DATA1: EEPROM, VPS, PDC, NICAM, BS AUDIO
CLK2 / DATA2: PLL, BS, SERVO
EXP2: SCART CTL, SECAM"H", MESECAM"H", DIGITAL LINK ON/OFF, SECAM-L BAND"H", SCART(PRESET)"H"
EXP3: TUNER SECAM"H", VCR"H"

BS"H" LNB CTL"H"

IC506 is defective.
TV-programmer doesn't operate.

Q550, Q551 are defective.
TV control or SCART control is unstable.

95. 4. 17. 7-818A

7. Tuner/IF Circuit Diagram (MODEL : VV 5000 MS)

VR701 Mis-adjustment.
Picture is abnormal. (unclear)

QA01 is defective.
Video signal doesn't appear on the TV.

TA01 Mis-adjustment.
- Tuning is failed.
- AFC is failed.

QA07 is defective.
Video signal doesn't appear on the TV.

TU701

ICA01 TDA9800 ZA01 OFWG1962

ICA05 SDA5649

ICA04 MSP3400

XA01 18.432MH

FL701 40.4MHz

FLA01 LPF12KHz

ZA02 PS5.5MB

ZA03 PS5.74MB

ZA05 SFE5.5MB

FROM MAIN

15	AGC ADJ	15
14	RF AGC	14
13	G.N.D(A)	13
12	IF	12
11	G.N.D(A)	11
10	12V(G)	10
9	VPS VIDEO IN	9
8	G.N.D(A)	8
7	TUNER V-OUT	7
6	G.N.D(A)	6
5	TU A-L OUT	5
4	G.N.D(A)	4
3	G.N.D	3
2	SECAM-L "H"	2
1	G.N.D	1

P7A05 PA701

BS TO IF

P8701	P7B01
1 BS AFC "H"	1
2 BS AFC "L"	2
3 G.N.D	3
4 DATA2 (BS)	4
5 CLK2 (BS)	5
6 BS ENABLE	6
7 G.N.D	7
8 TIMER "H"	8
9 G.N.D	9
10 G.N.D	10
11 G.N.D	11
12 EXP3 ENABLE	12

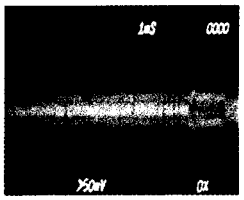
BS TO IF

P8702	P7B02
1 G.N.D	1
2 BS VIDEO	2
3 BS "H"	3
4 6.3VA	4
5 33VA	5
6 12V(G)	6
7 12/19VA	7
8 12VA	8
9 BS SIF	9
10 G.N.D	10

AUDIO SIGNAL
VPS VIDEO SIGNAL
BS SIF SIGNAL
VIDEO SIGNAL
BS VIDEO SIGNAL
SIF SIGNAL
IF SIGNAL
WAVEFORM

95.4. 17. 7-825B

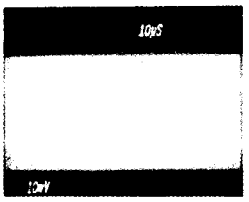
• Tuner/IF Waveform

① 

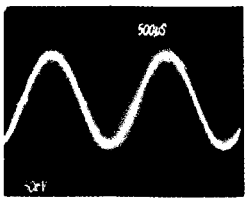
QA07 Base
IF Signal
(50mV/1msec)

②

PA701 Pin ⑦
Video Out Signal
(50mV/20μsec)

③ 

SIF Signal
(10mV/10μsec)

④ 

PA701 Pin ⑤
Tuner Audio Signal
(50mV/500μsec)

• Tuner/IF TR Voltage Sheet (Model: VV 5000 MS)

Port / TR No.	Emitter	Collector	Base
Q720	3.49	12.27	4.08
Q721	12.93	6.73	12.28
Q722	6.10	12.95	6.74
Q723	0.01	0.09	0.71
QA01	1.56	5.24	2.20
QA07	2.15	12.77	2.81

• Tuner/IF IC Voltage Sheet

REC

4.83	3.27	0.00	2.83	2.83	1.40	1.93	1.95	4.87	2.65
20				15					
ICA01 (TDA9800)									
1				5					10
3.32	3.32	0.75	0.25	3.15	2.64	2.15	3.29	2.15	1.74

• Tuner/IF TR Voltage Sheet (Model: VV 5000 M)

Port / TR No.	Emitter	Collector	Base
QA01	1.56	5.24	2.20
QA07	2.15	12.77	2.81
QA13	11.84	2.11	11.21
QA14	1.53	11.21	2.13

REC

4.96	1.31	1.46	2.61	2.58	2.61	0.01
			10			
ICA05 (SDA5649)						
1				5		
0.00	0.18	0.18	0.00	0.37	pulse	2.47

REC

0.00	2.37	2.38	0.00	0.23	1.55	1.55	4.91	0.00	3.82	2.68	3.81	3.81	0.00	3.82	3.81	0.00	3.82	3.82	3.84	3.84	3.82	3.77	0.00	7.54	8.46	7.54	3.83	3.82	0.00	3.82	3.82
60					55					50					45					40					35							
ICA04 (MSP3400)																															
1				5					10					15					20					25					30			
2.25	0.00	0.00	0.01	0.01	0.00	5.19	0.00	0.33	0.33	2.36	2.35	2.32	2.32	2.32	2.26	1.59	4.71	0.00	2.65	4.66	2.35	1.80	5.19	0.07	0.07	0.01	0.07	0.07	0.00	3.82	3.82

MEMO

Tuner/IF Circuit Diagram
(MODEL : VV 5000 M)

VR701 Mis-adjustment.
Picture is abnormal. (unclear)

QA01 is defective.
Video signal doesn't appear on the TV.

TA01 Mis-adjustment.
- Tuning is failed.
- AFC is failed.

QA07 is defective.
Video signal doesn't appear on the TV.

TU701

FROM MAIN

15	AGC ADJ	15
14	RF AGC	14
13	G.N.D(A)	13
12	IF	12
11	G.N.D(A)	11
10	12V(G)	10
9	VPS VIDEO IN	9
8	G.N.D(A)	8
7	TUNER V-OUT	7
6	G.N.D(A)	6
5	TU A-L OUT	5
4	G.N.D(A)	4
3	G.N.D	3
2	SECAM-L "H"	2
1	G.N.D	1

P7A05 PA701

ICA01 TDA9800

ZA01 0FWG1962

ICA05 SDA5649

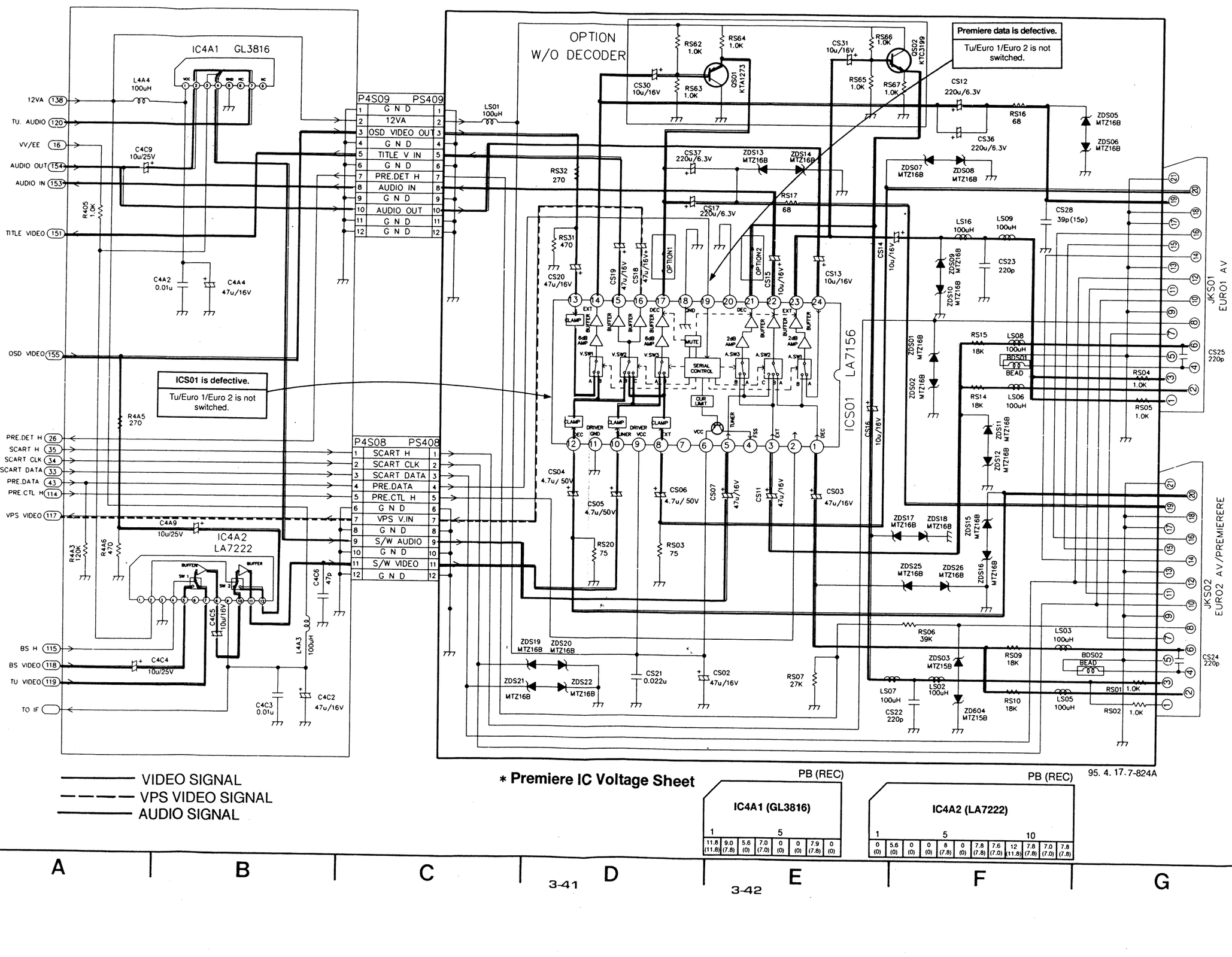
PB701	P7B01
1 BS AFC "H"	1
2 BS AFC "L"	2
3 G.N.D	3
4 DATA2 (BS)	4
5 CLK2 (BS)	5
6 BS ENABLE	6
7 G.N.D	7
8 TIMER "H"	8
9 G.N.D	9
10 G.N.D	10
11 G.N.D	11
12 EXP3 ENABLE	12

PB702	P7B02
1 G.N.D	1
2 BS VIDEO	2
3 BS "H"	3
4 6.3VA	4
5 3.3VA	5
6 12V(G)	6
7 12/19VA	7
8 12VA	8
9 BS SIF	9
10 G.N.D	10

IF SIGNAL
SIF SIGNAL
VIDEO SIGNAL
AUDIO SIGNAL
VPS VIDEO SIGNAL
WAVEFORM

95.4. 17. 7-825D

8. Premiere Circuit Diagram



*** Premiere IC Voltage Sheet**

PB (REC)

IC4A1 (GL3816)

1								5
11.8 (11.8)	9.0 (7.8)	5.6 (0)	7.0 (7.0)	0 (0)	0 (0)	7.9 (7.8)	0 (0)	

PB (REC)

IC4A2 (LA7222)

1					5					10
0 (0)	5.6 (0)	0 (0)	0 (0)	8 (7.8)	0 (0)	7.8 (7.8)	7.6 (7.0)	12 (11.8)	7.8 (7.8)	7.0 (7.0)	7.8 (7.8)

9. Pre-Amp Circuit Diagram

• Pre-Amp TR Voltage Sheet

(PB/REC mode)

TR No. \ Port	Emitter	Collector	Base
Q802	2.72/2.70	5.35/5.31	3.35/3.33
Q803	0.85/0.84	3.35/3.33	1.49/1.48
Q804	2.00/1.98	3.37/3.35	2.66/2.64
Q806	2.04/2.02	5.38/5.33	2.67/2.64
Q807	0.00/0.00	0/5.2	0/5.0

• Pre-Amp IC Voltage Sheet

PB (REC)

0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (4.29)	0.70 (0.09)	2.11 (3.81)	0.01 (4.30)	0.70 (0.10)	2.08 (3.82)	5.33 (5.18)	0.01 (4.27)	0.12 (1.68)
			20					15			
			IC801 (LA7410)								
1				5					10		
0.0 (0.0)	0.0 (2.7)	0.26 (0.18)	0.27 (5.10)	3.58 (1.21)	0.0 (0.0)	2.41 (3.54)	0.0 (3.55)	0.03 (1.57)	2.69 (2.61)	5.33 (4.52)	5.33 (5.18)

Q804, Q803, Q802 are defective.

- RF level is low in the PB mode.
- The screen has much noise in the PB mode.
- The playback doesn't operate and has the noise.

Q806 is defective.

REC FM is low in the REC mode.

TO AUDIO

P8403	PIN7
NC	1
VIDEO ENV	2
V.SW25	3
NC	4
NC	5
NC	6
NC	7

TO Y/C

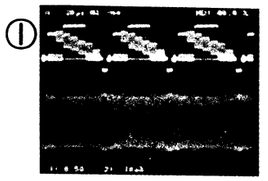
PIN12

P8302	P3809
1	C. SYNC
2	REC S. "H"
3	GND
4	REC C
5	REC Y
6	REG 6V
7	GND
8	PB C
9	NC
10	GND (A)
11	PB Y
12	NC

TO DRUM

P8D01	
SP A PLAY	1
SP A REC	2
G N D	3
SP B REC	4
SP B PLAY	5

• Pre-Amp Waveform

① 

IC801 Pin ⑧
REC Y FM

95. 4. 27. 7-823B

REC-Y
REC-C
PB-Y
PB-C
WAVEFORM

3-43
3-44

10. Function OSD Circuit Diagram

X001 is defective.
F.OSD is not operating.

Q061, Q062 are defective.
F.OSD character doesn't appear.

Q001, Q010 are defective.
Video signal doesn't appear on the TV screen.

IC003 NJM2229S

IC002 M35010

TO Y/C

P0301	P3907
1	NC
2	GND
3	NC
4	NC
5	OSD VIDEO IN
6	5V
7	OSD VIDEO OUT
8	GND
9	OSD CS
10	OSD CLOCK
11	OSD DATA
12	GND
13	SYNC "H"
14	REG 5.3V
15	NC

VIDEO SIGNAL (EE/PB)

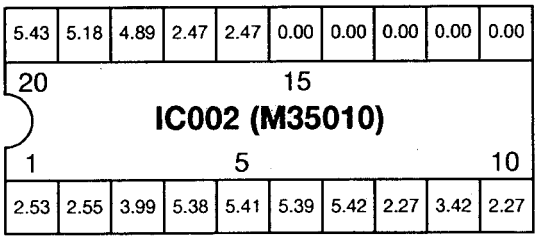
95. 3. 28. 7-822A

* **Function OSD TR Voltage Sheet** (PB/REC mode)

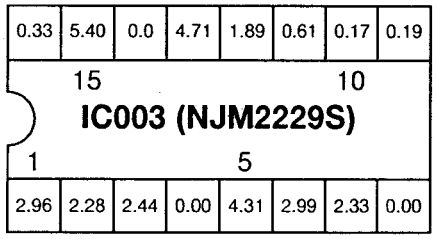
Port / TR No.	Emitter	Collector	Base
Q001	2.34/2.34	0.0/0.0	1.67/1.67
Q002	2.28/2.28	5.24/5.24	1.84/1.84
Q003	0.0/0.0	2.81/2.81	0.0/0.0
Q004	0.0/0.0	0.0/0.0	2.82/2.82
Q009	0.0/0.0	3.35/3.35	0.0/0.0
Q010	1.67/1.67	5.44/5.44	2.28/2.28
Q011	2.28/2.28	5.40/5.40	2.90/2.90
Q012	0.0/0.0	4.90/4.90	0.0/0.0
Q014	5.36/5.36	5.23/5.23	0.0/0.0
Q060	2.69/2.69	2.69/2.69	3.35/3.35
Q061	0.0/0.0	5.18/5.18	0.17/0.17
Q062	0.0/0.0	4.90/4.90	0.33/0.33

* **Function OSD IC Voltage Sheet**

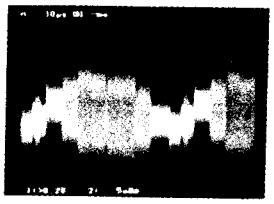
PB



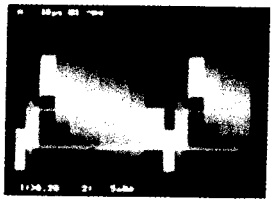
PB



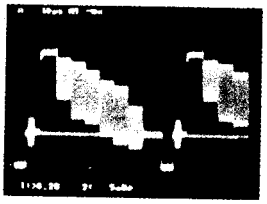
• **BS Waveform**

① 

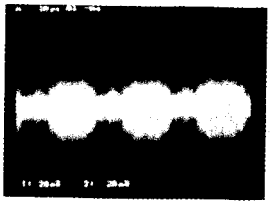
TU702 Pin ⑦
Base Band Signal
(0.2V/10μsec)

② 

Q704 Emitter
Dispersual Video Signal
(0.2V/10μsec)

③ 

C707 (+)
VIDEO Signal
(0.2V/10μsec)

④ 

IC701 Pin ⑱
SIF Signal
(20mV/20μsec)

• **BS TR Voltage Sheet**

Port / TR No.	Emitter	Collector	Base
Q701	9.75	2.85	9.12
Q702	3.42	12.14	3.98
Q703	12.77	6.52	12.14
Q704	5.90	12.78	6.52
Q705	18.61	18.60	17.90
Q706	0.00	0.07	4.93
Q707	18.62	18.60	17.92
Q708	0.00	0.10	3.97
Q709	13.11	18.56	14.35
Q710	13.09	12.89	12.34
Q711	0.00	0.06	4.75
Q712	5.01	4.91	4.29
Q713	0.00	0.04	4.74
Q714	0.00	0.02	4.75
Q715	18.59	18.58	17.88
Q716	0.0	0.09	4.93
Q717	18.58	18.58	17.89
Q718	18.58	17.89	18.53
Q719	0.00	3.97	0.02

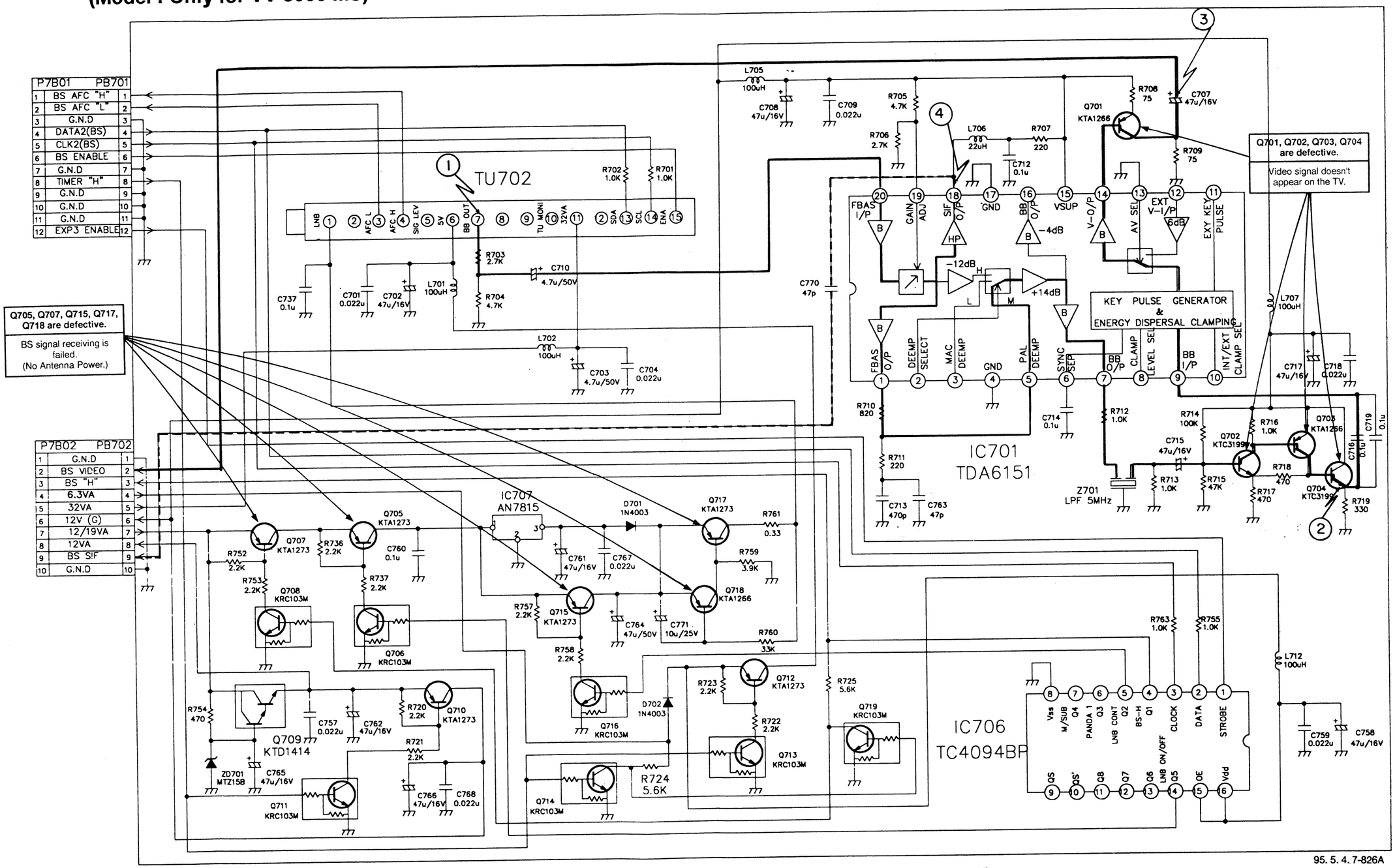
• **BS IC Voltage Sheet**

3.49	4.64	12.56	0.02	9.39	12.70	9.25	0.00	1.23	3.16
20					15				
IC701 (TDA6151)									
1				5					10
4.19	2.87	4.18	0.01	4.19	2.39	4.07	3.14	2.58	3.16

5.04	5.04	4.95	0.01	0.01	0.00	2.36	2.36
15						10	
IC706 (TC4094BP)							
1			5				
0.12	0.72	0.73	4.95	4.95	5.03	5.03	0.00

IC707 (AN7815)
1
18.47 / 0 / 15.22

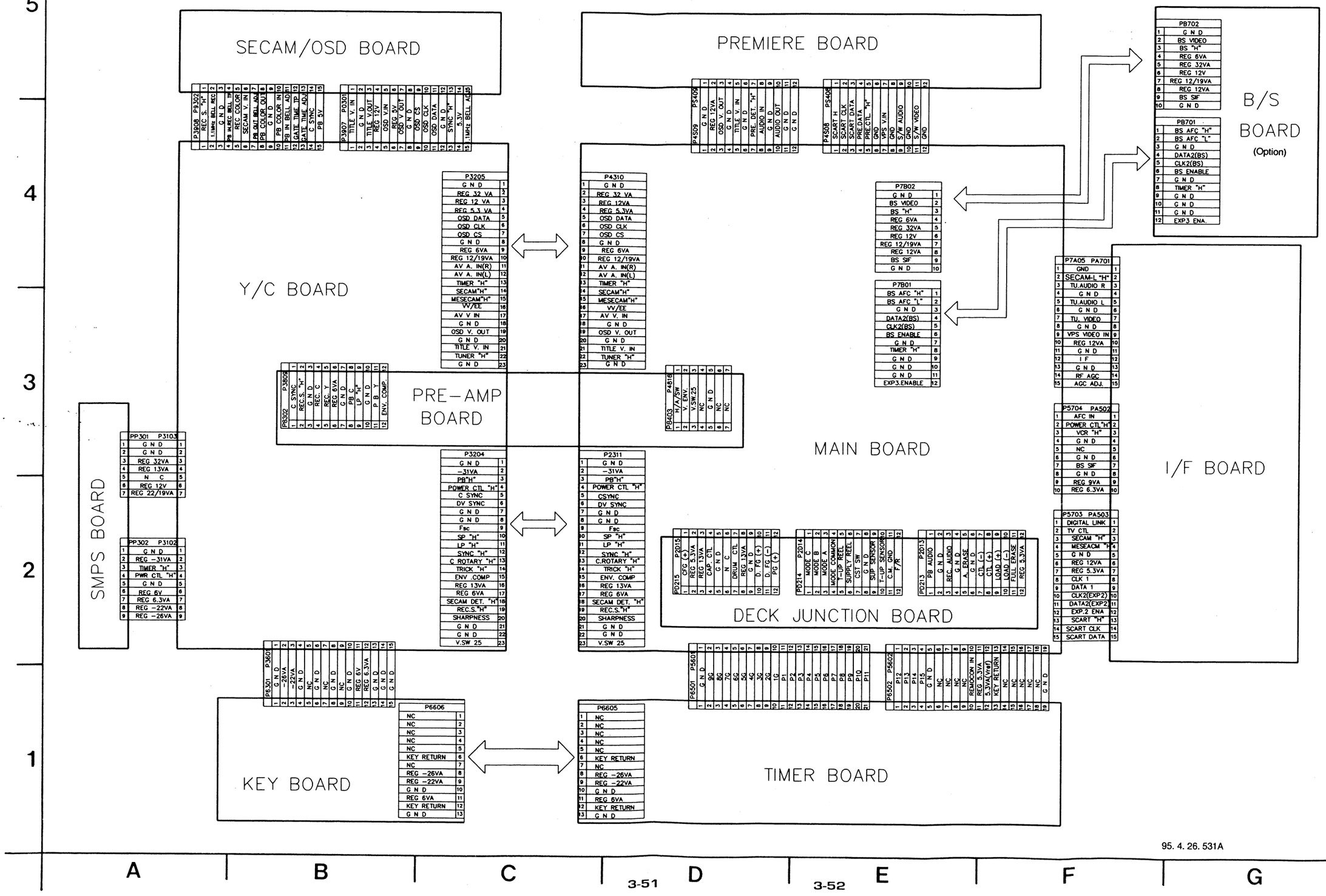
11. BS Circuit Diagram
(Model : Only for VV 5000 MS)


P7B01 PB701
1 BS AFC "H" 1
2 BS AFC "L" 2
3 G.N.D 3
4 DATA2(BS) 4
5 CLK2(BS) 5
6 BS ENABLE 6
7 G.N.D 7
8 TIMER "H" 8
9 G.N.D 9
10 G.N.D 10
11 G.N.D 11
12 EXP3 ENABLE 12
P7B02 PB702
1 G.N.D 1
2 BS VIDEO 2
3 BS "H" 3
4 6.3VA 4
5 32VA 5
6 12V (G) 6
7 12/19VA 7
8 12VA 8
9 BS SIF 9
10 G.N.D 10
TU702
LNB AFC L AFC H SIG LEV 5V BB OUT TU MONI 32VA SDA SCL ENA
IC701 TDA6151
FBAS I/P GAIN ADJ SIF O/P GND BB O/P VSUP V-O/P AV SEL EXT V-I/P EXY KEY PULSE
FBAS O/P DEEMP SELECT MAC DEEMP GND PAL DEEMP SYNC SEP BB O/P CLAMP LEVEL SEL BB I/P INT/EXT CLAMP SEL
KEY PULSE GENERATOR & ENERGY DISPERSAL CLAMPING
IC707 AN7815
IC706 TC4094BP
Vss M/SUB Q4 PANDA 1 Q3 LNB CONT Q2 BS-H Q1 CLOCK DATA STROBE
QS QS' Q8 Q7 Q6 LNB ON/OFF Q5 OE Vdd
Z701 LPF 5MHz
Q701, Q702, Q703, Q704 are defective.
Video signal doesn't appear on the TV.
Q705, Q707, Q715, Q717, Q718 are defective.
BS signal receiving is failed. (No Antenna Power.)
95. 5. 4. 7-826A

VIDEO SIGNAL — BASEBAND SIGNAL

WAVEFORM — BS SIF SIGNAL

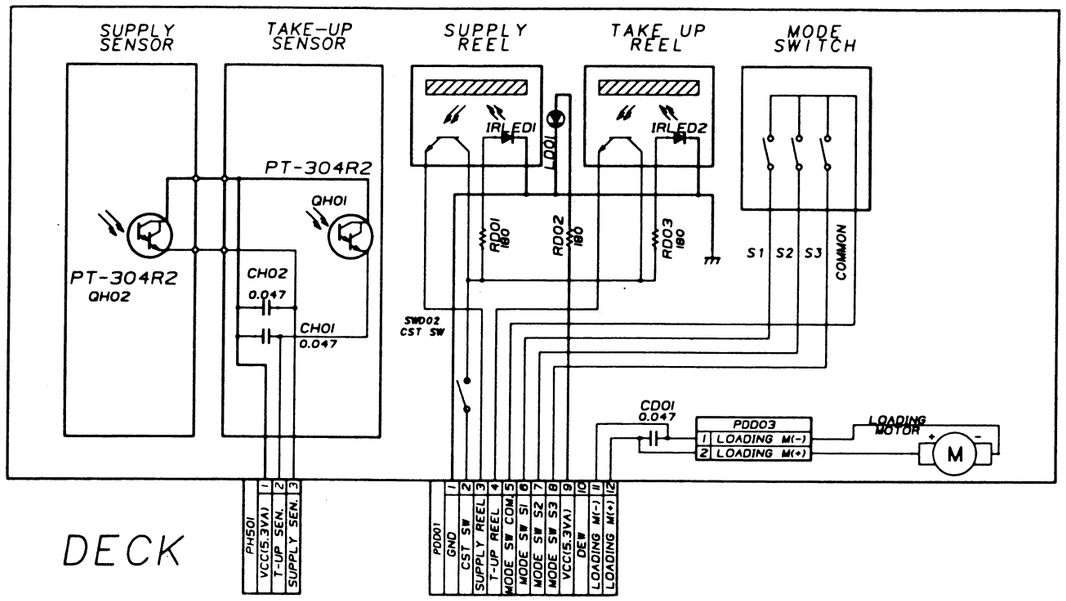
12. Connection Diagram



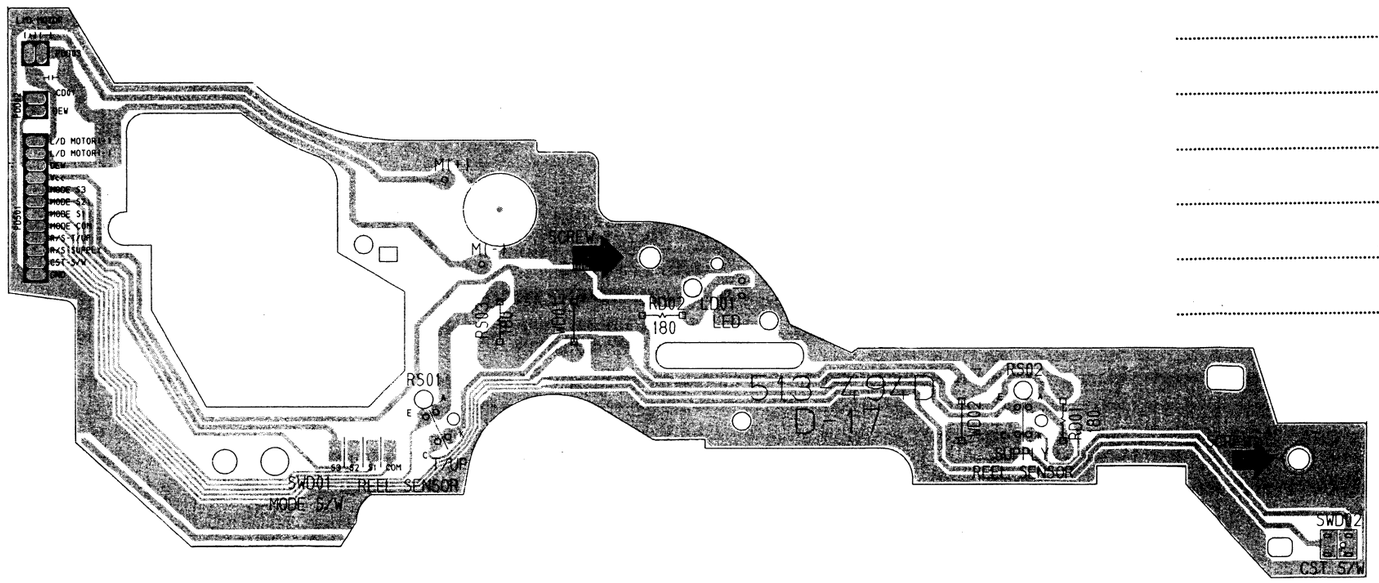
95. 4. 26. 531A

DECK JUNCTION

1. Deck Junction Circuit Diagram



2. Deck Junction P.C.Board

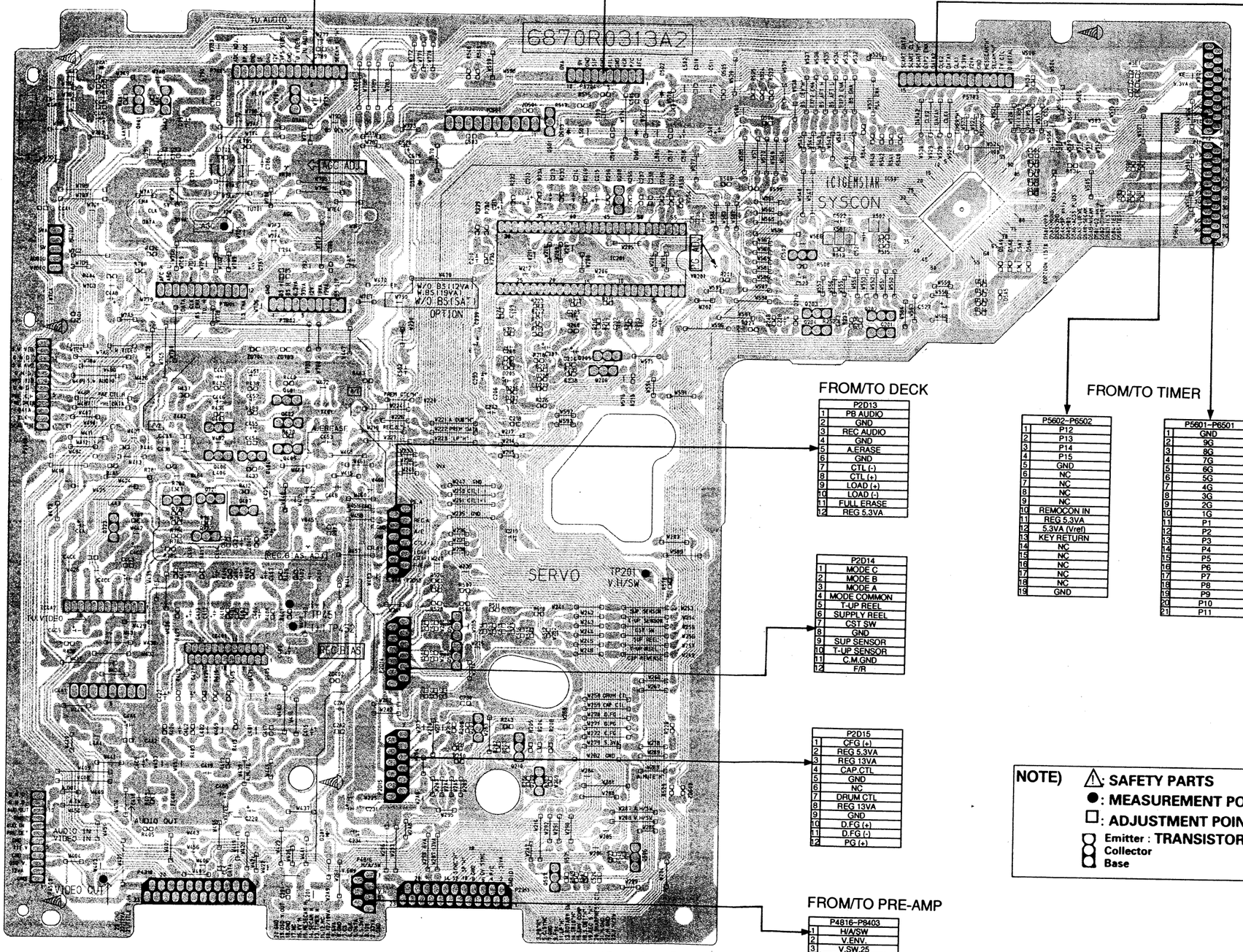


(Solder Side)

MEMO

PRINTED CIRCUIT BOARD DIAGRAMS

1. Main 1 P.C.Board



FROM/TO IF

P7A05-PA701	
1	GND
2	SECAM-L "H"
3	TU.AUDIO R
4	GND
5	TU.AUDIO L
6	GND
7	TU.VIDEO
8	GND
9	VPS VIDEO IN
10	REG 12VA
11	GND
12	IF
13	GND
14	RF AGC
15	AGC ADJ.

P5704-PA502	
1	AFC IN
2	POWER CTL "H"
3	VCR "H"
4	GND
5	NC
6	GND
7	BS SIF
8	GND
9	REG 9VA
10	REG 6.3VA

P5703-PA503	
1	DIGITAL LINK
2	TV CTL
3	SECAM "H"
4	MESECAM "H"
5	GND
6	REG 12VA
7	REG 5.3VA
8	CLK 1
9	DATA 1
10	CLK 2 (EXP2)
11	DATA 2 (EXP2)
12	EXP.2 ENA
13	SCART "H"
14	SCART CLK
15	SCART DATA

FROM/TO DECK

P2D13	
1	PB AUDIO
2	GND
3	REC AUDIO
4	GND
5	A.ERASE
6	GND
7	CTL (-)
8	CTL (+)
9	LOAD (+)
10	LOAD (-)
11	FULL ERASE
12	REG 5.3VA

P2D14	
1	MODE C
2	MODE B
3	MODE A
4	MODE COMMON
5	T-UP REEL
6	SUPPLY REEL
7	CST SW
8	GND
9	SUP SENSOR
10	T-UP SENSOR
11	C.M.GND
12	F/R

P2D15	
1	CFG (+)
2	REG 5.3VA
3	REG 13VA
4	CAP.CTL
5	GND
6	NC
7	DRUM CTL
8	REG 13VA
9	GND
10	D.FG (+)
11	D.FG (-)
12	PG (+)

FROM/TO PRE-AMP

P4816-P8403	
1	H/A/SW
2	V.ENV
3	V.SW 25
4	NC
5	GND
6	NC
7	NC

FROM/TO TIMER

P5602-P6502	
1	P12
2	P13
3	P14
4	P15
5	GND
6	NC
7	NC
8	NC
9	NC
10	REMOCON IN
11	REG 5.3VA
12	5.3VA (Vref)
13	KEY RETURN
14	NC
15	NC
16	NC
17	NC
18	NC
19	GND

P5601-P6501	
1	GND
2	9G
3	8G
4	7G
5	6G
6	5G
7	4G
8	3G
9	2G
10	1G
11	P1
12	P2
13	P3
14	P4
15	P5
16	P6
17	P7
18	P8
19	P9
20	P10
21	P11

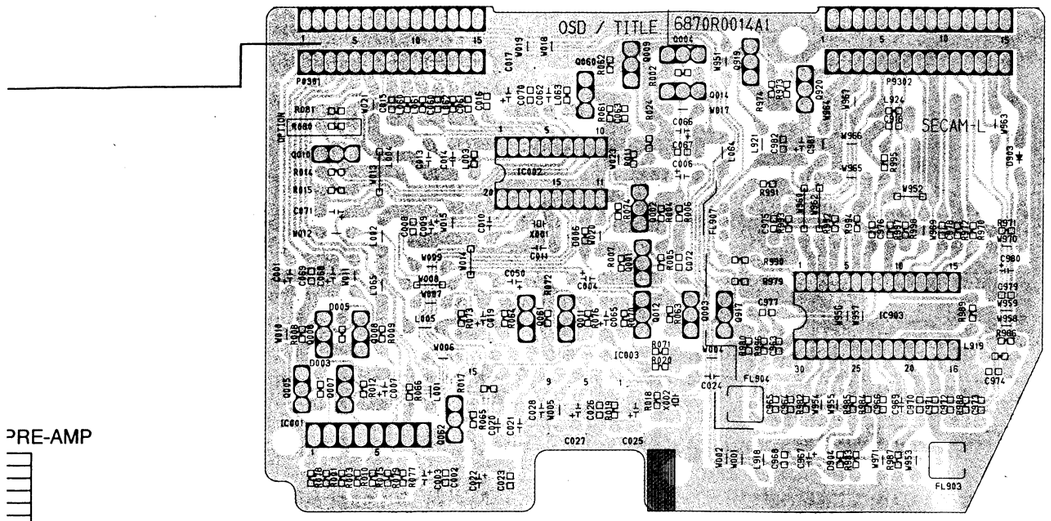
NOTE)
- ⚠: SAFETY PARTS
- ●: MEASUREMENT POINT
- □: ADJUSTMENT POINT
- Emitter : TRANSISTOR, Collector, Base

ABBREVIATIONS

ADJ : ADJUSTMENT
AFC : AUTOMATIC FREQUENCY CONTROL
AGC : AUTOMATIC GAIN CONTROL
AUD : AUDIO
CAR : CARRIER
COL : COLOR
DEV : DEVIATION
EE : Electric to Electric
ENV : ENVELOP
FRE : FREQUENCY
LEV : LEVEL
LUM : LUMINANCE
OSC : OSCILLATION
PB : PLAYBACK
PG : PULSE GENERATOR
REC : RECORDING
SIF : SOUND INTERMEDIATE FREQUENCY
VOL : VOLTAGE

LOCA NO.	Posi-tion
IC201	4C
IC401	2B
IC4A1	2A
IC4A2	2A
IC501	4E
IC503	4D
IC504	5C
Q201	4D
Q202	4D
Q203	4D
Q204	4D
Q205	3C
Q206	3C
Q207	2C
Q208	4C
Q209	1C
Q210	2C
Q401	3B
Q402	3B
Q403	3B
Q404	3B
Q405	3B
Q406	3B
Q407	3B
Q4A1	5A
Q4A2	5A
Q501	5C
Q502	2C
Q503	2C
Q506	1C
Q507	1C
Q720	3A
Q721	3A
Q722	3A
Q723	3A
Q7A1	5B

3. Function OSD P.C.Board



(Solder Side)

PRE-AMP

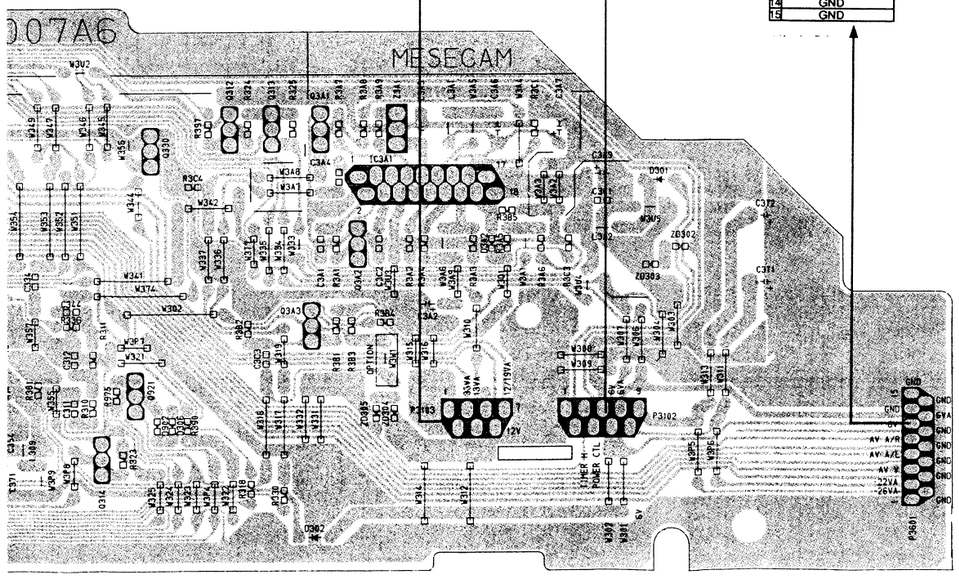
FROM/TO POWER

P3103-PP301	
1	GND
2	GND
3	REG 32VA
4	REG 13VA
5	NC
6	REG 12V
7	REG 22/19VA

P3102-PP302	
1	GND
2	REG -31VA
3	TIMER "H"
4	PWR CTL "H"
5	GND
6	REG 6V
7	REG 6.3VA
8	REG -22VA
9	REG -26VA

FROM/TO KEY FUNCTION

P3601-P6301	
1	GND
2	-26VA
3	-22VA
4	GND
5	NC
6	GND
7	NC
8	GND
9	NC
10	GND
11	REG 6V
12	REG 6.3VA
13	GND
14	GND
15	GND

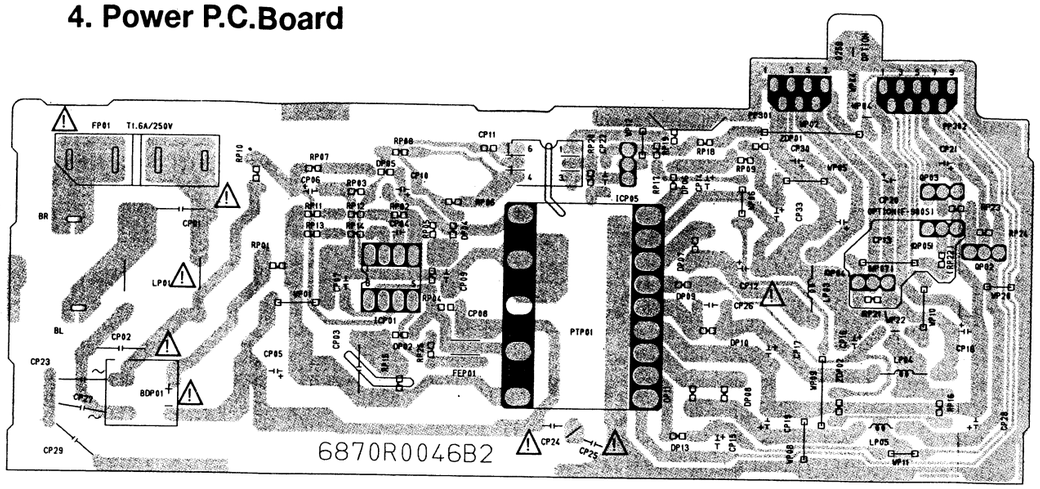


(Solder Side)

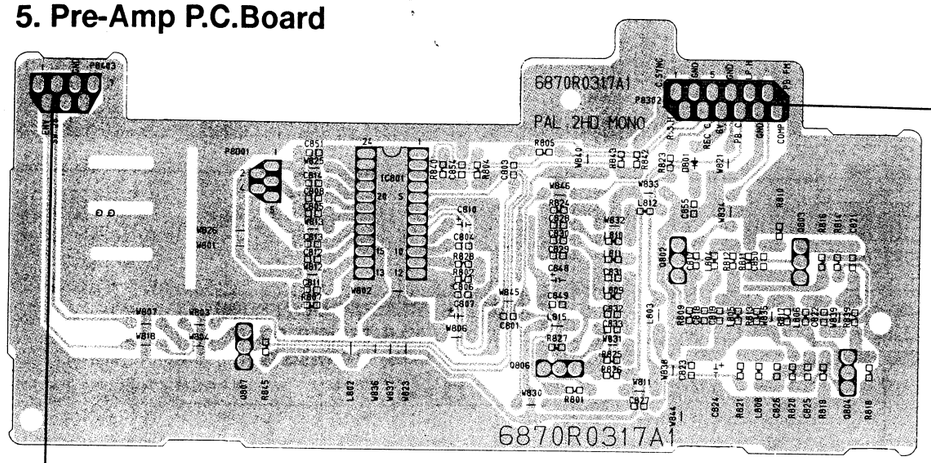
LOCA NO.	Posi-tion
IC3A1	2E
IC301-	1B
IC303	1D
IC901	3B
IC902	2B
Q305	2B
Q309	1B
Q312	2E
Q313	2E
Q314	1D
Q315	2C
Q316	2C
Q317	2C
Q318	2C
Q319	2C
Q320	2D
Q321	2D
Q322	1B
Q323	1A
Q324	3A
Q325	1B
Q326	3A
Q327	3B
Q330	2D
Q331	1C
Q334	3C
Q335	4B
Q901	3B
Q902	3B
Q906	2A
Q907	2A
Q921	1D
Q3A1	2E
Q3A3	2E
Q3A2	2E
IC001	5E
IC002	5F
IC903	4G
Q062	4E
Q001	4F
Q002	4F
Q003	4F
Q004	5F
Q005	4E
Q006	4E
Q007	4E
Q008	4E
Q009	5F
Q010	5E
Q011	4F
Q012	4F
Q014	5F
Q060	5F
Q061	4F
Q917	4F
Q919	5F
Q920	5G

D E F G H

4. Power P.C.Board



5. Pre-Amp P.C.Board



(Solder Side)

FROM/TO Y/C

P8302-P3809	
1	Q SYNC
2	REC.S.TH'
3	GND
4	REC.C
5	REC.Y
6	REG 6VA
7	GND
8	PB C
9	LP TH'
10	GND
11	PB Y
12	ENV.COMP.

6. Timer P.C.Board

(Solder Side)

FROM/TO MAIN

P6502-P5602	
1	P12
2	P13
3	P14
4	P15
5	GND
6	NC
7	NC
8	NC
9	NC
10	REMOCON IN
11	REG 5.3VA
12	5.3VA (Vref)
13	KEY RETURN
14	NC
15	NC
16	NC
17	NC
18	NC
19	GND

P6501-P5601	
1	GND
2	9G
3	8G
4	7G
5	6G
6	5G
7	4G
8	3G
9	2G
10	1G
11	P1
12	P2
13	P3
14	P4
15	P5
16	P6
17	P7
18	P8
19	P9
20	P10
21	P11

NOTE) ⚠ : **SAFETY PARTS**

Emitter : TRANSISTOR
Collector
Base

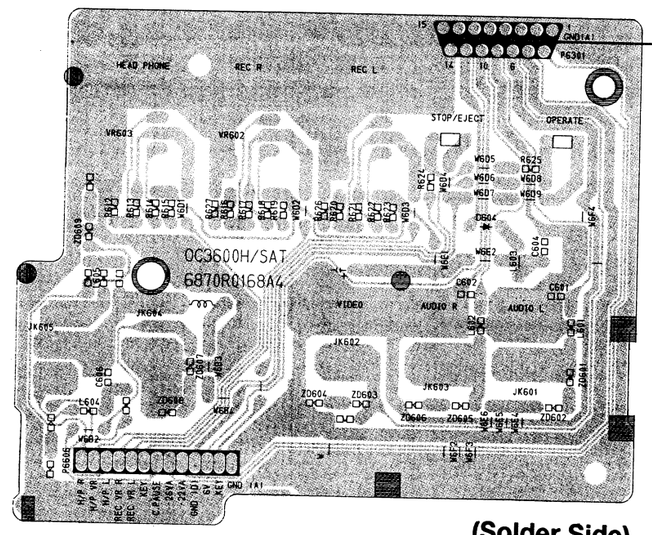
LOCA NO.	Position
ICP01	4B
ICP05	5C
QP02	5D
QP03	5D
QP04	4C
QP05	5D

LOCA NO.	Position
IC801	4F
IC802	4E
Q802	5F
Q803	5G
Q804	4G
Q805	5G
Q806	4F

FROM/TO MAIN

P8403-P4816	
1	H/A/SW
2	V.ENV.
3	V.SW.25
4	NC
5	GND
6	NC
7	NC

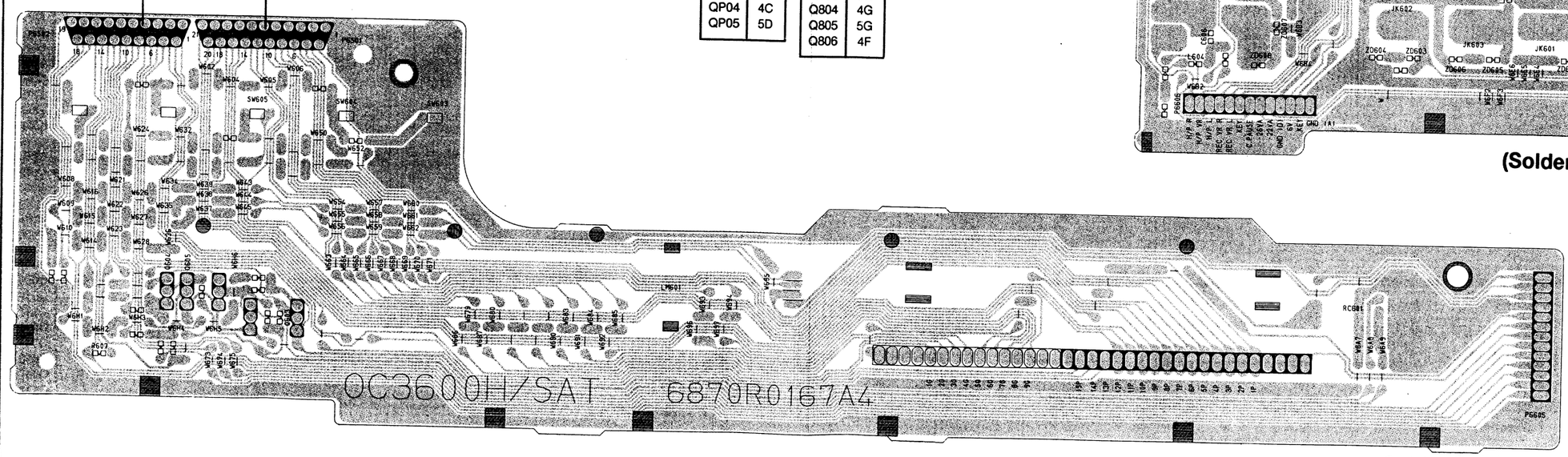
7. Key Function P.C.Board



(Solder Side)

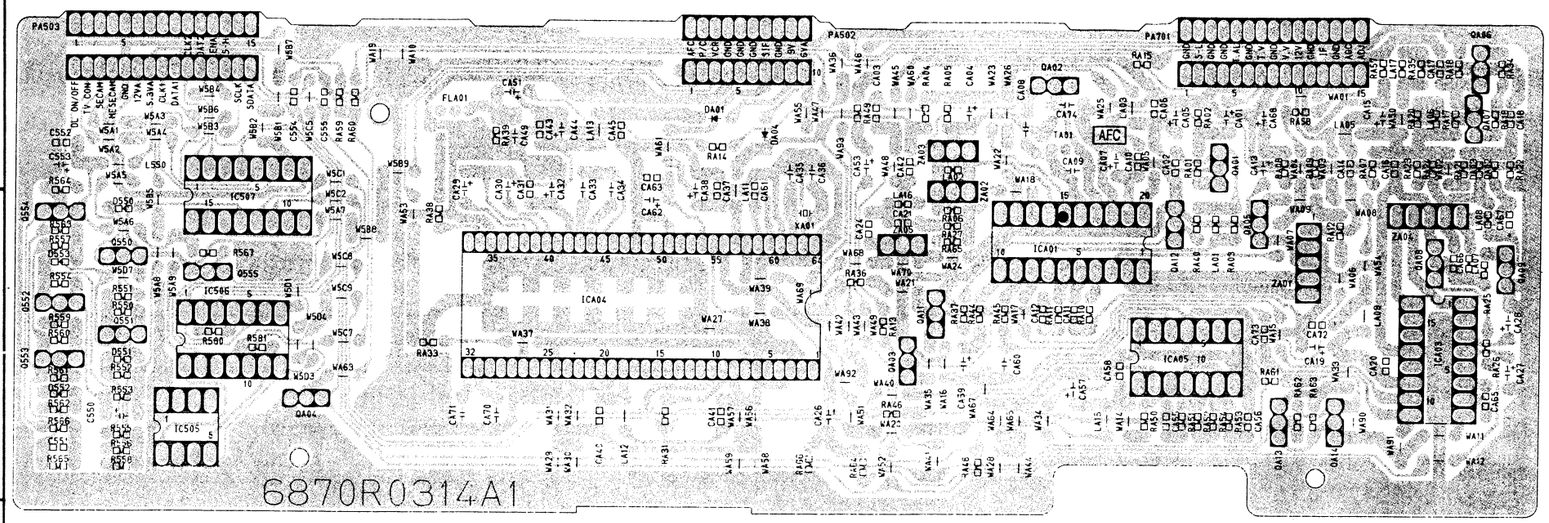
FROM/TO Y/C

P6301-P3601	
1	GND
2	-26VA
3	-22VA
4	GND
5	NC
6	GND
7	NC
8	GND
9	NC
10	GND
11	REG 6V
12	REG 6.3VA
13	GND
14	GND
15	GND



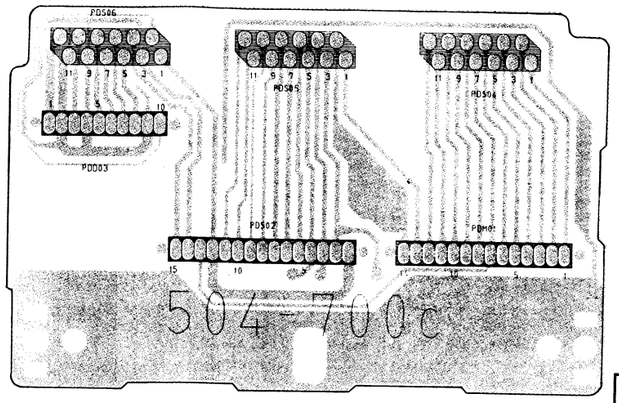
(Solder Side)

8. IF P.C.Board



(Solder Side)

9. Junction P.C.Board

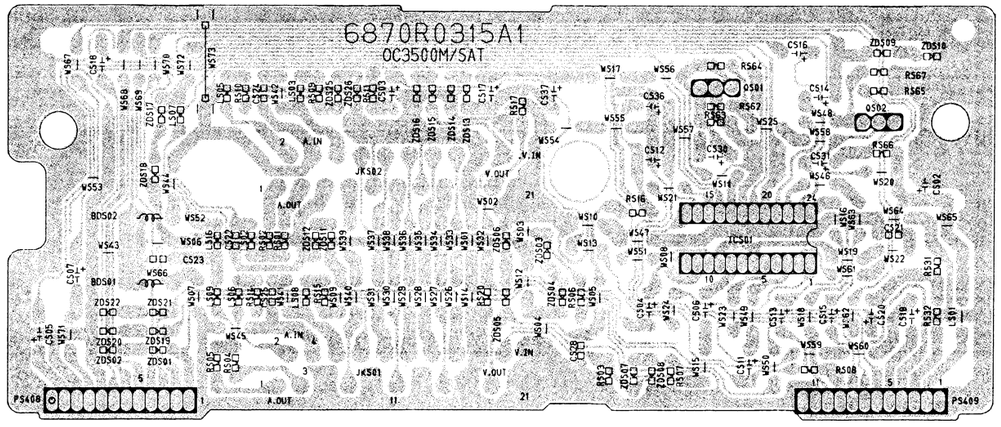


(Solder Side)

LOCA NO.	Position
IC505	4A
IC506	4A
IC507	4A
ICA01	4D
ICA03	4E
ICA04	4B
ICA05	4D
Q550	4A
Q551	4A
Q552	4A
Q553	4A
Q554	4A
Q555	4A
QA01	5D
QA02	5D
QA03	4C
QA04	4B
QA05	4D
QA06	5E
QA07	5E
QA08	4E
QA09	4E
QA11	4C
QA12	4D
QA13	4E
QA14	4E

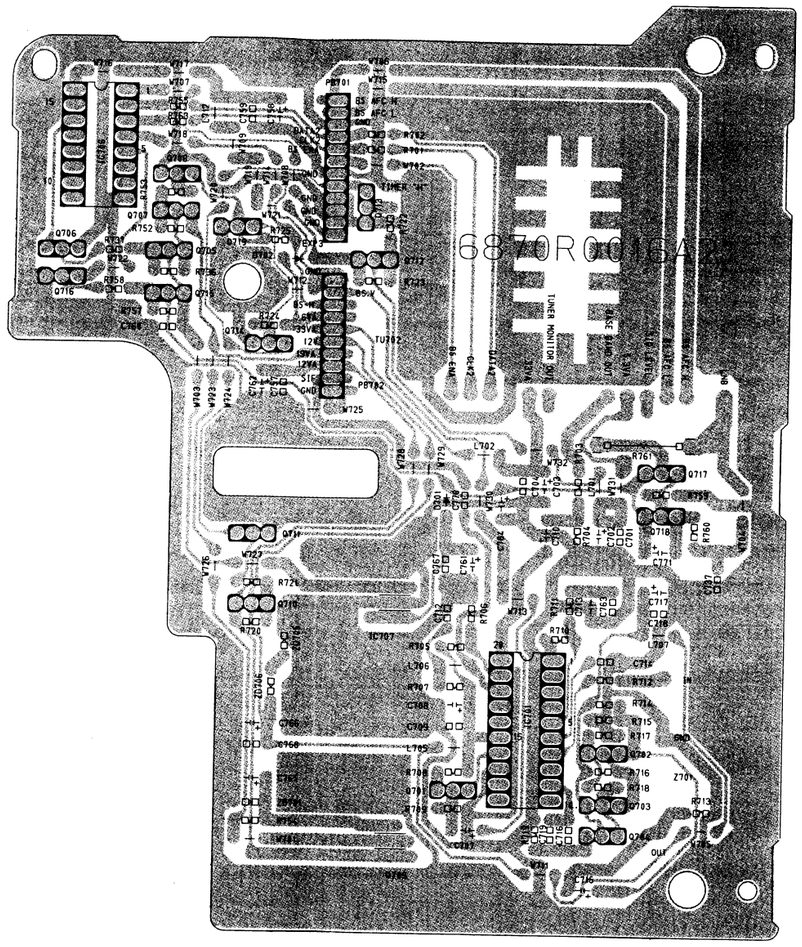
NOTE) ● : MEASUREMENT POINT
□ : ADJUSTMENT POINT
Emitter : TRANSISTOR
Collector
Base

10. SCART P.C.Board



LOCA NO.	Position
ICS01	1C
QS01	2C
QS02	2C

11. BS P.C.Board



(Solder Side)

LOCA NO.	Posi-tion
IC701	3C
IC706	5A
Q701	2B
Q702	3C
Q703	2C
Q704	2C
Q705	4B
Q706	4A
Q708	4A
Q710	3B
Q711	3B
Q712	4B
Q713	4B
Q714	4B
Q715	4B
Q716	4A
Q717	4C
Q718	3C
Q719	4B

MEMO

SECTION 4
MECHANISM
CONTENTS

FRONT LOADING MECHANISM DISASSEMBLY

- Front Loading Mechanism Parts Location 4-3
1. Front Loading Mechanism Assembly ... 4-4
2. PCB Assembly 4-5
   2-1. PCB Assembly (R) 4-5
   2-2. PCB Assembly (L) 4-5
3. Top Plate 4-5
4. Carrier Bracket Assembly 4-6
   4-1. Carrier Bracket Assembly 4-6
   4-2. Cassette Opener 4-6
   4-3. Rid Opener 4-6
   4-4. Detect Lever and Detect Spring 4-6
   4-5. Support Bracket Assembly 4-7
   4-6. Carrier Bracket Assembly 4-7
5. Cassette Guide 4-7
6. Bracket Assembly Side 4-8
7. Bracket Assembly (L), (R) 4-8
8. Door Opener 4-8
9. Drive Gear Assembly 4-8
   9-1. Drive Gear Assembly 4-8
   9-2. Cushion Spring 4-8
   9-3. Cap-D 4-8
   9-4. Spring C.C 4-8
   9-5. Gear C 4-8
   9-6. Gear R 4-9
   9-7. Spring R 4-9
   9-8. Gear L 4-9
   9-9. Spring L 4-9
   9-10. Switch Lever 4-9

DECK MECHANISM DISASSEMBLY

- Deck Mechanism Parts Location 4-10
1. Auto Head Cleaner Assembly 4-11
2. Drum and Drum Base Assembly 4-11
3. Drum Assembly 4-11
   3-1. Drum Sub and Motor Assembly 4-11
   3-2. Upper and Lower Drum Assembly .. 4-12
4. A/C Head Assembly 4-12
5. Pinch Lever Assembly 4-12
6. Loading Motor Assembly 4-13
7. Take Up Lever 4-13
8. Take Up Arm Assembly 4-13
9. P4 Assembly 4-14
10. Pinch Gear 4-14
11. Full Erase Head Assembly 4-14
12. P1 Assembly 4-15
13. Tension Arm Assembly 4-15
14. Supply Soft, Supply Main, Take Up Soft and Take Up Main Brake Assembly 4-15
15. Bracket F/R Assembly 4-15
16. Supply Reel Assembly 4-16
17. Take Up Reel Assembly 4-16
18. Idler Gear (A), (B) 4-16
19. Pulley Gear Assembly 4-16
20. Bracket Bottom Assembly 4-16
21. Junction PCB Assembly 4-16
22. Capstan Motor/Brake Assembly 4-17
23. Function Plate 4-17
24. Ratchet Lever Assembly 4-18
25. Cam Gear, Rack T, Rack F.L 4-18
26. PC Gear 4-19
27. P2 and P3 Slant Assembly 4-19
28. Loading Gear Assembly 4-19
29. Tension Lever Assembly 4-20
30. Clutch Gear Assembly 4-20

MECHANISM ADJUSTMENT

- Tools and Fixtures for Deck 4-21
1. Mechanism State Switch (Mode Switch) Check 4-22
2. Preparation for Adjustment (To set VCR to the Loading State without inserting a cassette) 4-23
3. Tension post position and Tension Adjustment 4-24
4. Checking Torque 4-25
5. Guide Roller Height Adjustment 4-27
6. Audio/Control (A/C) Head Adjustment ... 4-29
7. X-Value Adjustment 4-30
8. Adjustment after Replacing Drum Assembly (Video Heads) 4-31
9. Check of Tape Travel after Reassembling Deck Assembly 4-30
   9-1. Check Audio and RF Locking Time during Playback after CUE or REV .. 4-30
   9-2. Check the coincidence of both Audio and Video Sync. (Lip sync.) .. 4-31
   9-3. Check the occurance of tape curl and Jam 4-31
   9-4. Check the adjustment state of Take-Up Guide 4-31
10. Maintenance/Inspection Procedure 4-32

MECHANISM TROUBLESHOOTING GUIDE

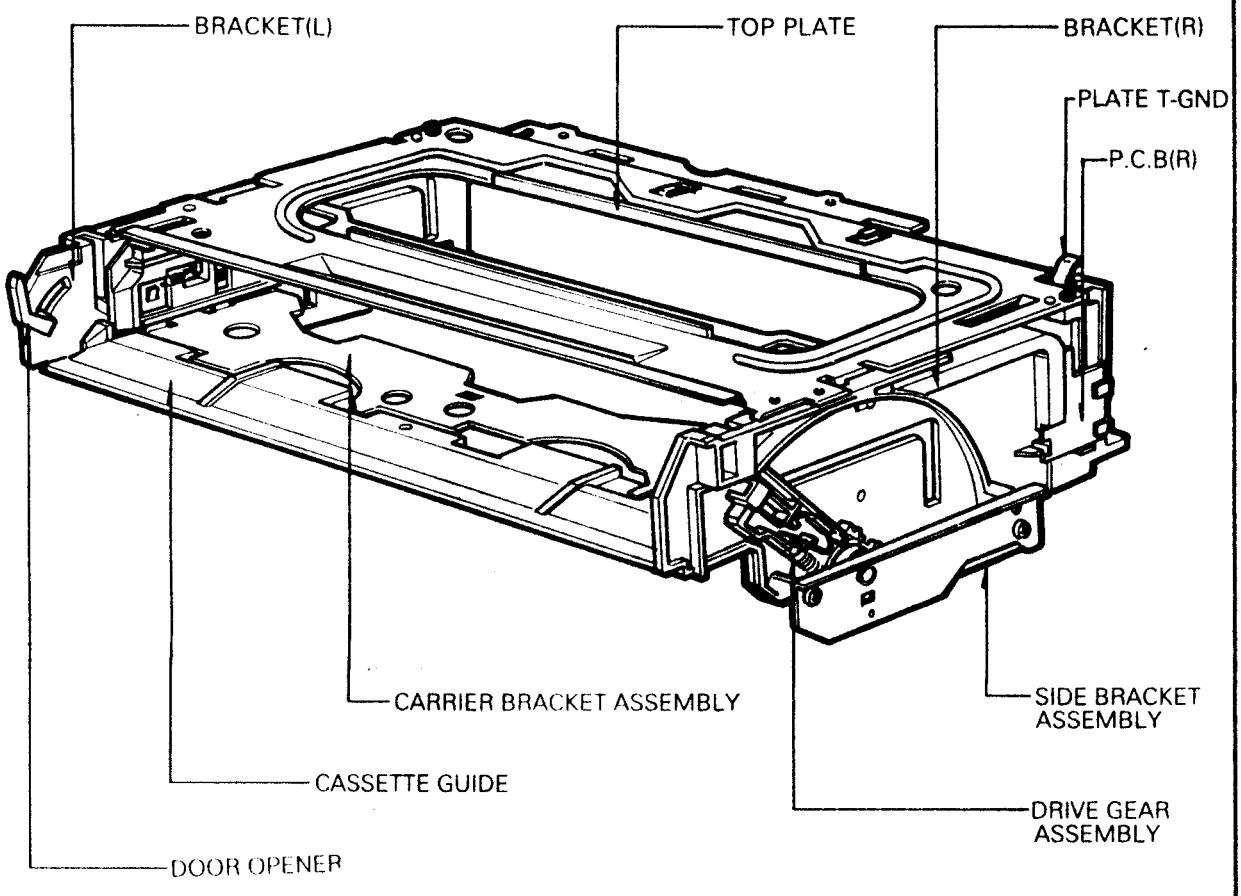
1. Deck Mechanism 4-35
2. Front Loading Mechanism 4-39

EXPLODED VIEWS

1. Moving Mechanism Section (I) 4-41
2. Moving Mechanism Section (II) 4-43
3. Front Loading Mechanism Section 4-45

FRONT LOADING MECHANISM DISASSEMBLY

• Front Loading Mechanism Parts Location



Front Loading Mechanism Parts Location

1. Component list below will be discribed as if the top and bottom covers and the front panel have already been removed.
2. P.C.B Assembly
3. Top Plate
4. Carrier Bracket Assembly
5. Cassette Guide
6. Side Bracket Assembly
7. Bracket(L), (R)
8. Door Opener
9. Drive Gear Assembly

1. Front Loading Mechanism Assembly (Fig. A-1-1)

1) Remove the Top and Bottom Covers and the Front panel.
2) Unplug the connector.
3) Remove two screws(A).
4) Lift up the Front Loading Mechanism in the direction of arrow(C).

*** NOTE**

1) When disassembling and reassembling

① Give special attention to removal and to reassemble, because two tabs(D) are engaged.

② Make sure that Bosses of Bracket(L),(R) are properly engaged in the holes of the chassis.

③ To reassemble Front Loading Mechanism, the Drive Gear Assembly should be turned in a counterclockwise as shown in Fig. A-1-2 so that the Rack Gear N.D of Front Loading Mechanism Assembly is meshed into Rack Gear F.L of Deck Mechanism Assembly correctly as shown in Fig. A-1-1.(B).

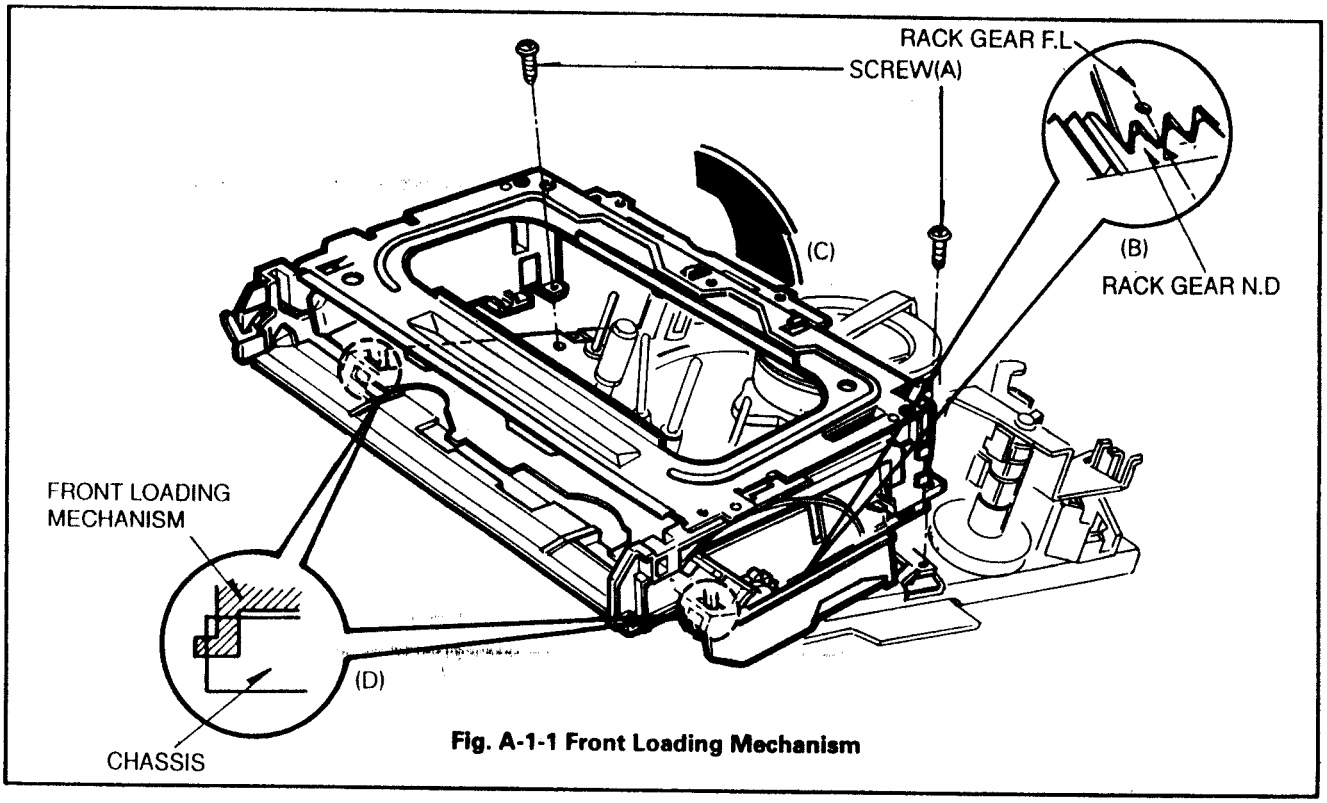


Fig. A-1-1 Front Loading Mechanism

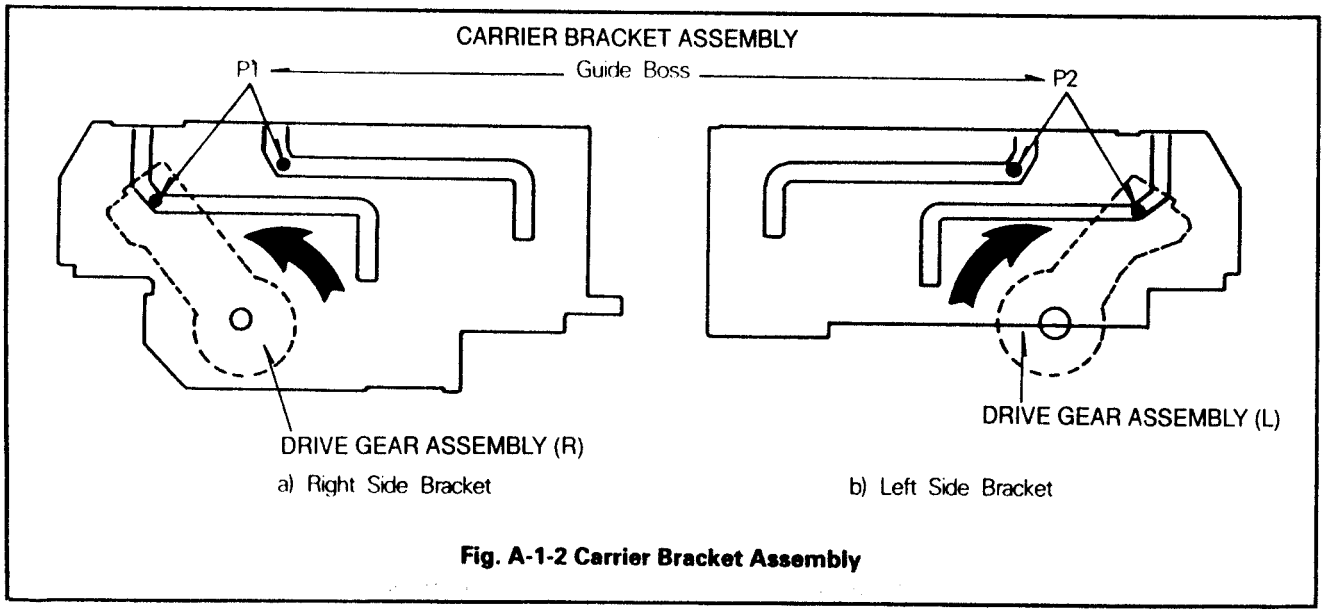


Fig. A-1-2 Carrier Bracket Assembly

2. PCB(Printed Circuit Board) Assembly

2-1. P.C.B Assembly(R)(Fig. A-2)

1) Remove the PCB Assembly(R) by pushing three Hooks (A) outward.
2) Release the Lead wire from stoppers.

2-2. PCB Assembly(L).(Fig. A-2)

1) Remove the PCB Assembly(L) by pushing the Hook(B) outward.
2) Release the Lead Wire from stoppers.

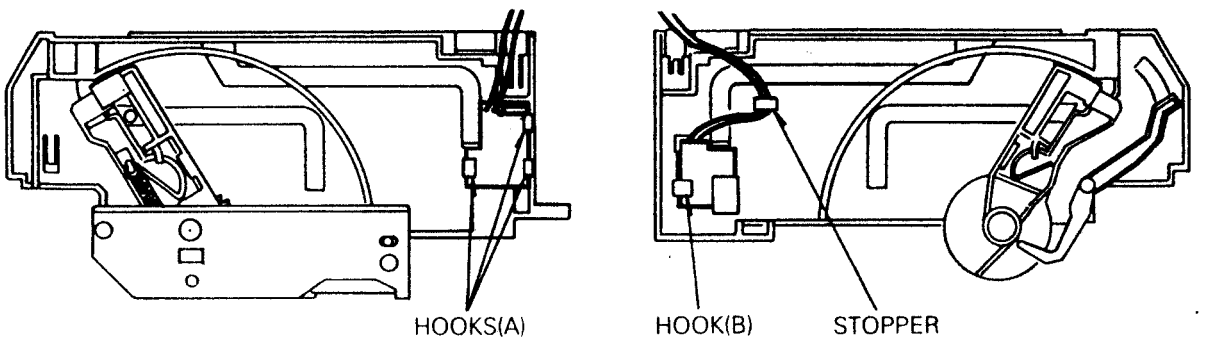


Fig. A-2 PCB Assembly

3. Top Plate(Fig. A-3)

1) Remove two screws(A).
2) Push the upper part of Top plate Ground and then lift up the Top Plate in the direction of arrow(B).

*** NOTE**

1) When reassembling, be certain that the tabs(C) of Top Plate is in both Bracket(L),(R).
2) Then align the guide holes(D) of Top Plate with Bosses of side Bracket(L),(R).

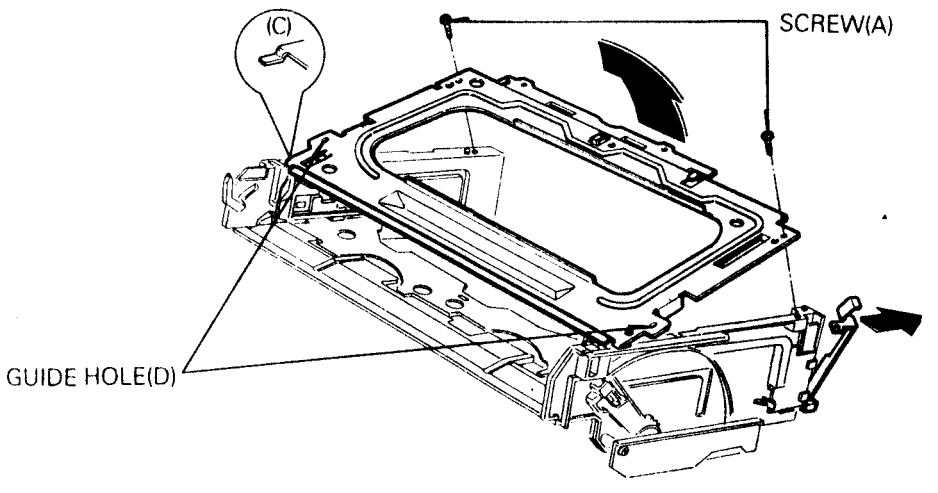


Fig. A-3 Top Plate

4. Carrier Bracket Assembly

4-1. Carrier Bracket Assembly(Fig. A-4-1)

1) Remove the Carrier Bracket Assembly by moving it in the direction of arrow(C).

*** NOTE**

1) When reassembling, be sure that parts(A) of Carrier Bracket Assembly are seated in parts(B) of Bracket(L),(R).

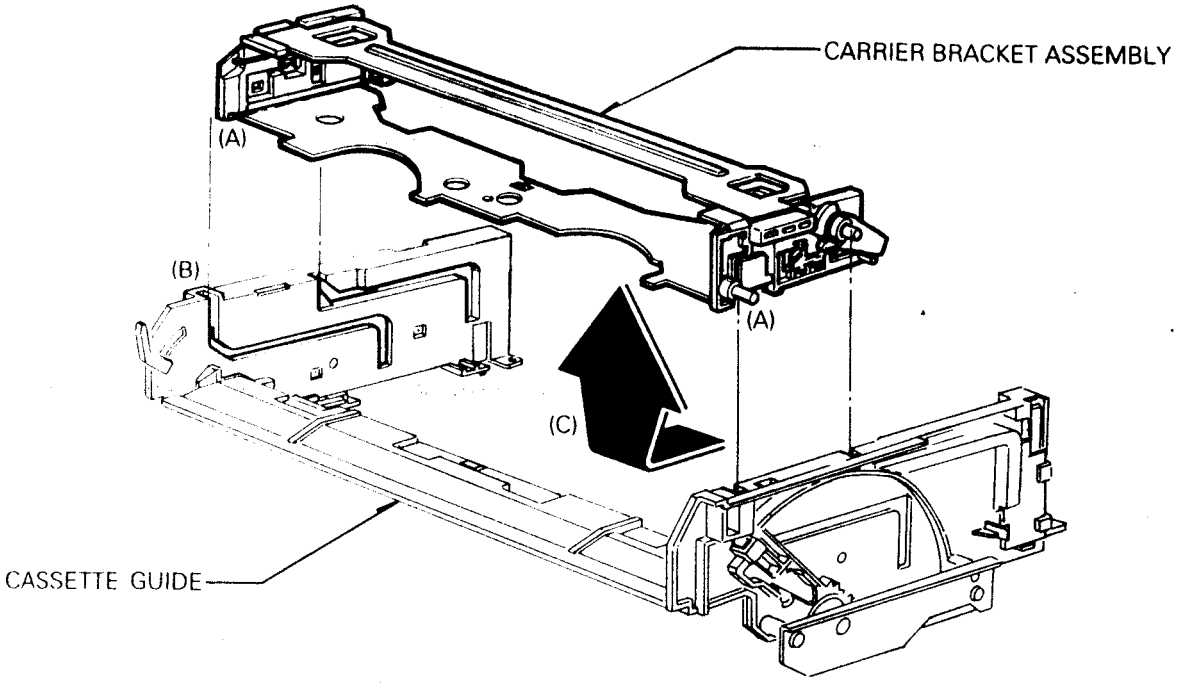


Fig. A-4-1 Carrier Bracket Assembly

4-2. Cassette Opener(Fig. A-4-2)

1) Release the spring O.C from the Hook(A) and then release it from Hook(C) of cassette opener.
2) Remove the cassette opener by releasing the Hook(B) from the Holder(R).

4-3. Rid Opener(Fig. A-4-2)

1) Remove the rid opener by pushing it outward.

*** NOTE**

1) When reassembling, seat the upper part of the rid opener in the grooved of Holder(R) and push it inward.

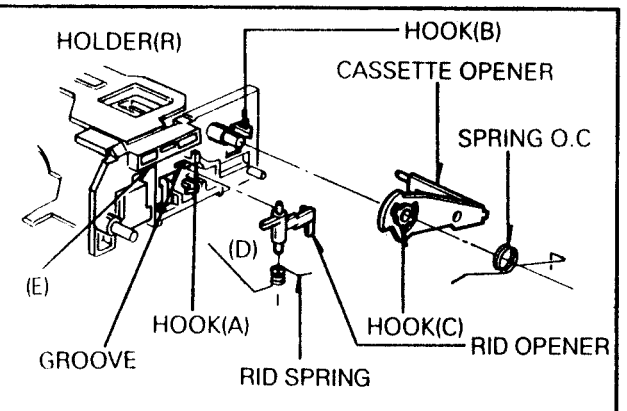


Fig. A-4-2 Cassette Door Opener/Rid Opener

4-4. Detect Lever and Detect Spring

1) Remove the spring detect.
2) Lower the side(A) of Detect Lever and then remove the Detect Lever by pushing it outward.

*** NOTE**

1) When reassembling, make sure that the part(C) of Detect Lever set in the part(B) of Holder(R).

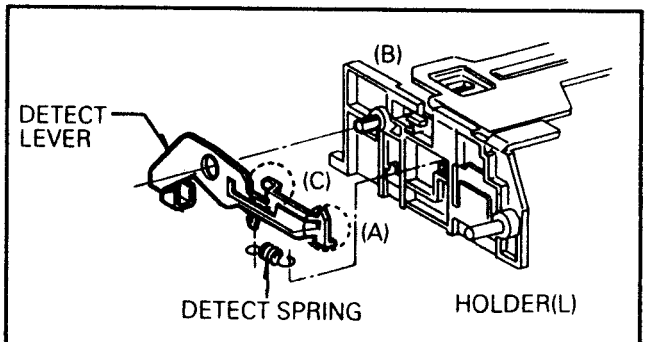


Fig. A-4-3 Detect Lever, Detect Spring

4-5. Support Bracket Assembly(Fig. A-4-4)

1) Take the Support Bracket out by releasing hooks(A),(B).

*** NOTE**

1) When disassembling and reassembling, be careful because heavy force can damage the hooks.

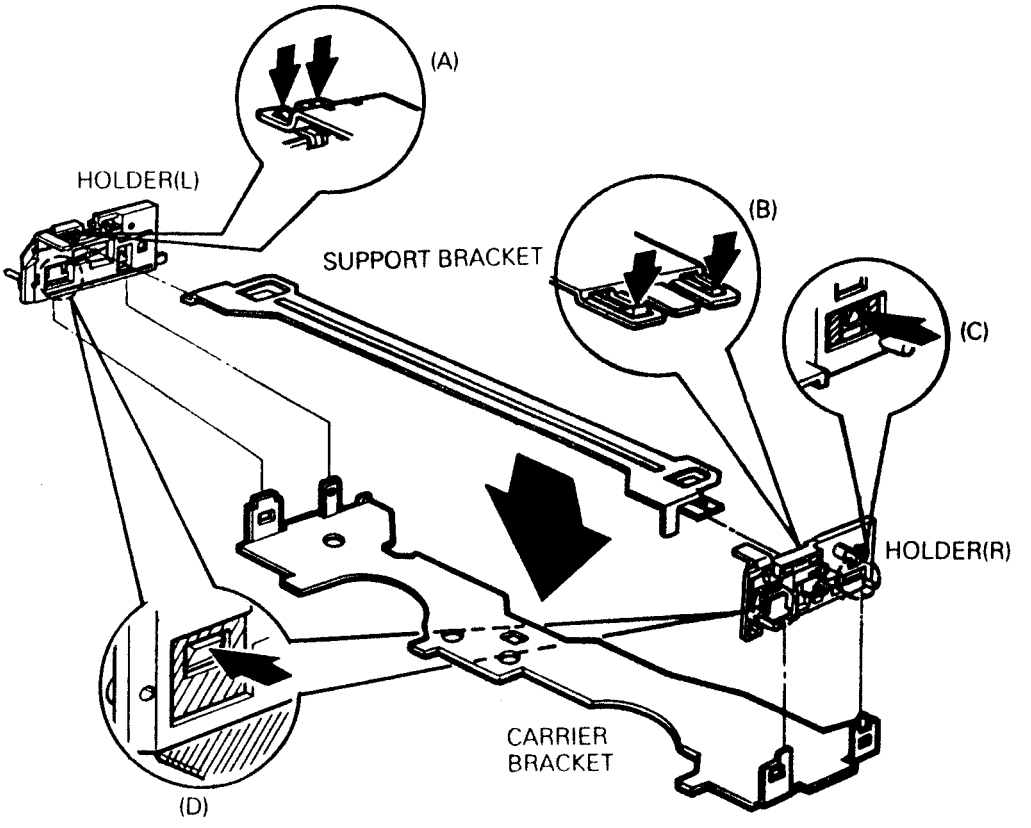


Fig. A-4-4 Support Bracket/Carrier Bracket

4-6. Carrier Bracket Assembly(Fig. A-4-4)

1) Remove the Carrier Bracket by releasing hooks(C),(D).

5. Cassette Guide(Fig. A-5)

1) Remove the Switch Spring with the Front Loading Mechanism Assembly turned over.
2) Push two hooks(B) outward.
3) Remove the Cassette Guide by pushing two hooks(A). outward(if one is removed, the other will be easy to remove)

*** NOTE**

1) When reassembling
(1) Seat projections(E) of Cassette Guide in holes of Bracket Assembly(L),(R) and then engage the Hook(A).
(2) After finishing previous step, fix the Cassette Guide to the Bracket Assembly(L),(R) by pushing two hooks(B) inward.

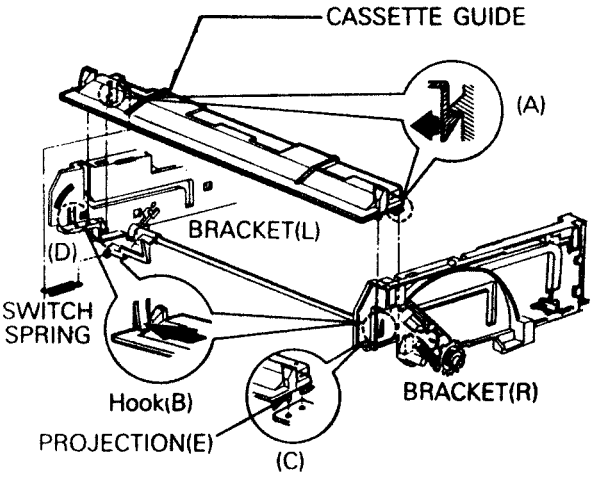


Fig. A-5 Cassette Guide

6. Bracket Assembly Side (Fig. A-6-1)

1) Remove two screws(A) and then remove the Side Bracket Assembly and the Rack Gear N.D.

*** NOTE**

1) When reassembling

(1) Turn the Drive Gear Assembly in the direction of arrow (C).

(2) Reassemble the Rack Gear N.D. to the Side Bracket Assembly, as shown in Fig. A-6-2, and then reassemble it to the Bracket Assembly(L). This time the Assembling Figure should be the same as(B) at the rectangular hole of Bracket Side.

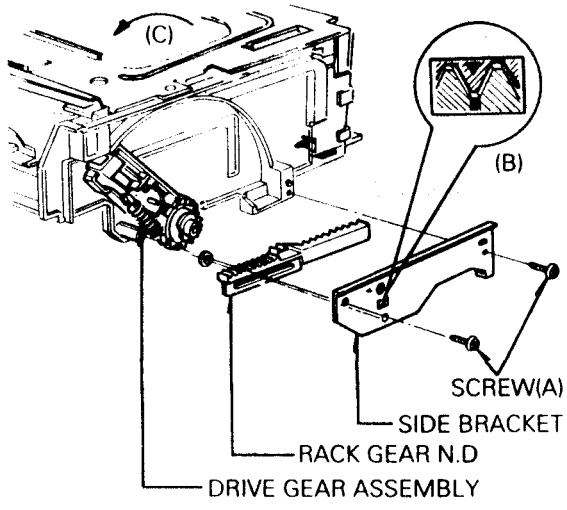


Fig. A-6-1 Side Bracket Assembly

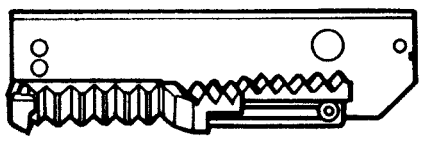


Fig. A-6-2

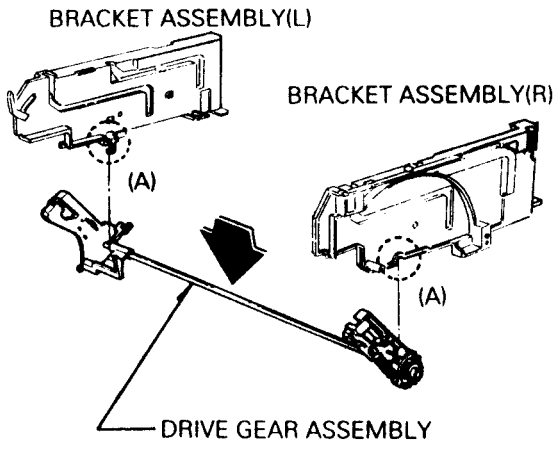


Fig. A-7 Bracket Assembly(L),(R)

7. Bracket Assembly(L),(R)(Fig. A-7)

1) Seperate the Bracket Assembly(L),(R) from the Gear Assembly Drive.

*** NOTE**

1) When reassembling, seat the shaft in the part(A) of Bracket Assembly(L),(R).

8. Door Opener(Fig. A-8)

1) Remove the Door Opener by pushing Hook(A) outward.

*** NOTE**

1) When reassembling, seat the part(B) of Door Opener in the hole( ) of Bracket(L).

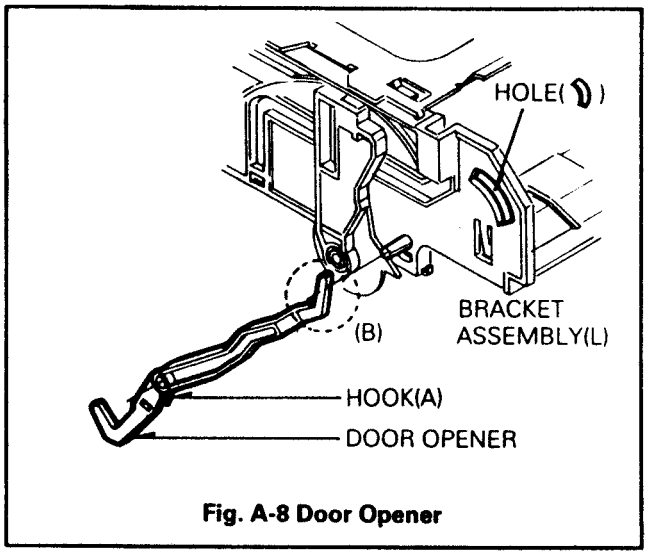


Fig. A-8 Door Opener

9. Drive Gear Assembly

9-1. Drive Gear Assembly(Fig. A-9-1)

1) Remove the Drive Gear Assembly from the Bracket Assembly(L),(R).

9-2. Cushion Spring(Fig. A-9-1)

1) Remove the cushion spring from the Gear R .

9-3. Cap-D(Fig. A-9-1)

1) Remove the Cap-D by lifting it up.

9-4. Spring C.C(Fig. A-9-1)

1) Remove the Spring C.C from the Gear R.

9-5. Gear C(Fig. A-9-1)

1) Remove the Gear C by lifting up when the projection of Gear C is aligned with the hole of Gear R while rotating the Gear C in the counterclockwise direction.

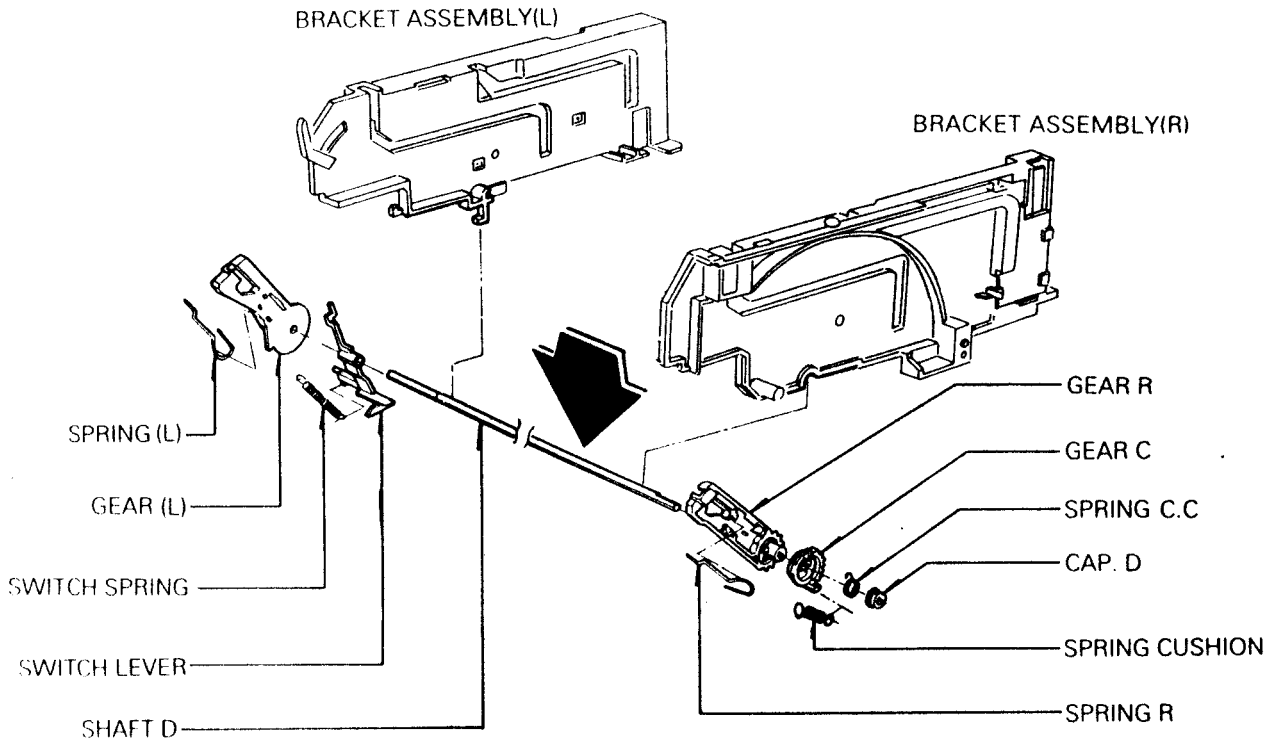


Fig. A-9-1 Drive Gear Assembly

*** NOTE**

1) When reassembling, seat the projections of Gear R in the holes of Gear C when the projection of Gear R is aligned with the hole of Gear C, and then keep the Gear C turned in the clockwise direction.

9-6. Gear R(Fig. A-9-1)

1) Lift up the Gear R from the Shaft.

9-7. Spring R(Fig. A-9-2)

1) Remove the Spring R by releasing Hooks.

*** NOTE**

1) When reassembling, be certain Spring R in the part(A) of Gear R.

9-8. Gear L.(Fig. A-9-1)

1) Remove the Gear L from the shaft.

9-9. Spring L (Fig. A-9-2)

1) Remove the Spring L by releasing Hooks from the Gear L.

*** NOTE:** (Refer to the Spring R Section)

9-10. Switch Lever(Fig. A-9-1)

1) Remove the Switch Lever from the shaft.

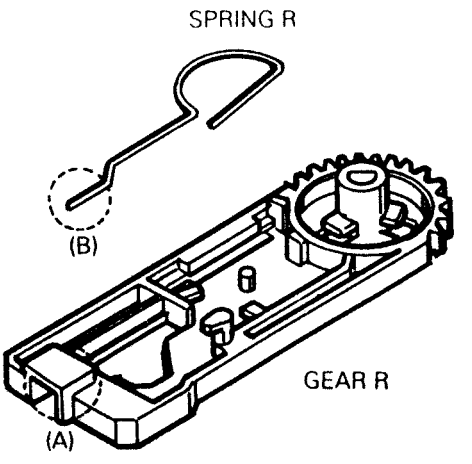
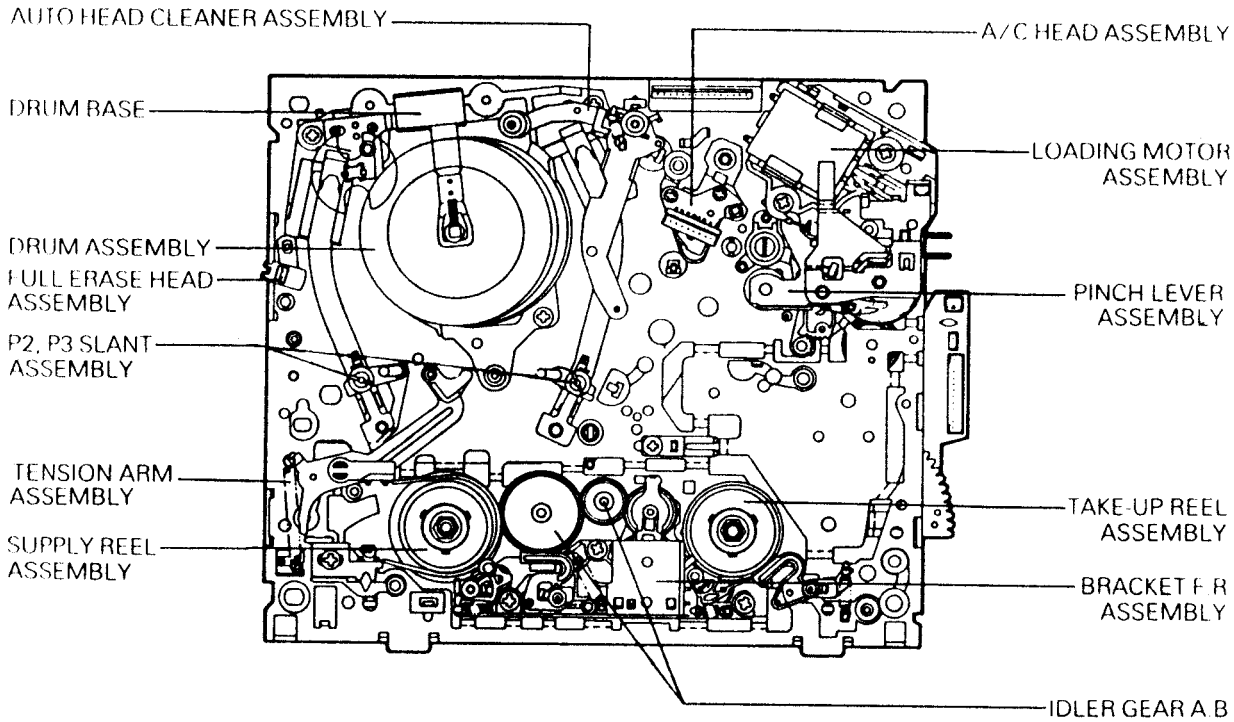


Fig. A-9-2 Spring R

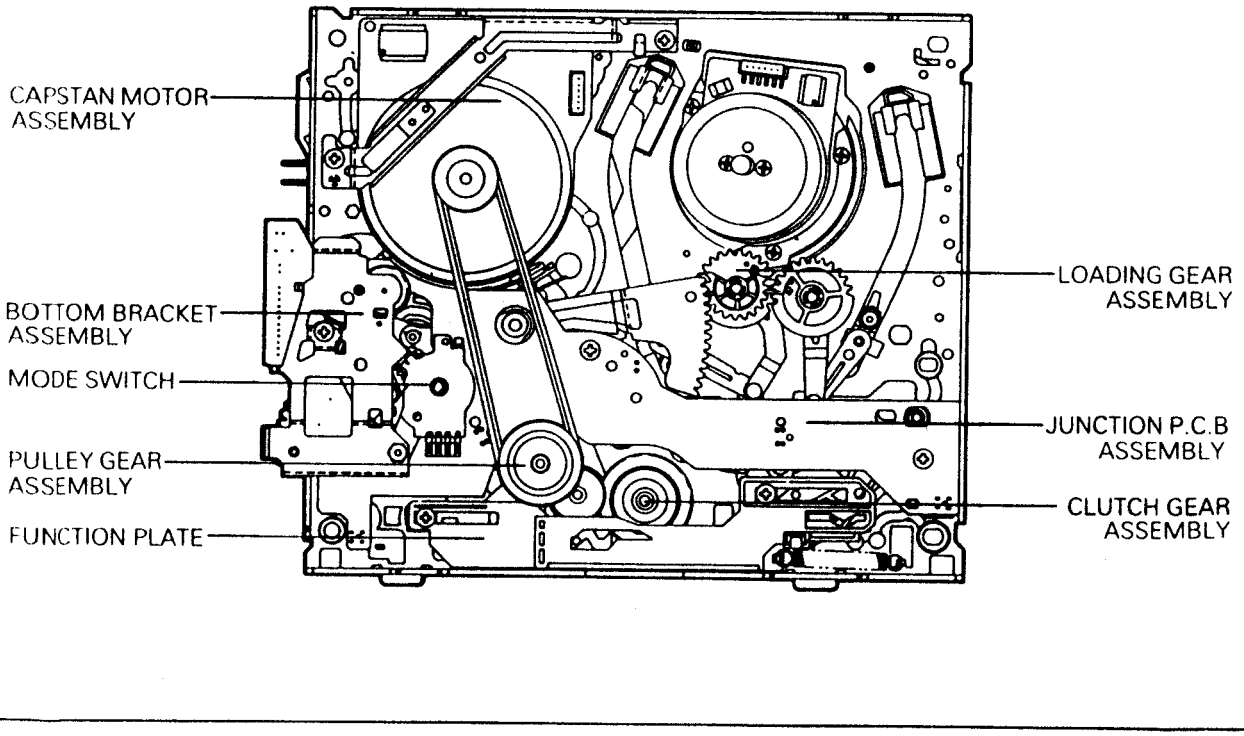
DECK MECHANISM DISASSEMBLY

• Deck Mechanism Parts Location

Top Side



Bottom Side



1. Auto Head Cleaner Assembly (Fig. B-1) (Optional Item)

1) Remove the Cleaner Arm Assembly (Auto Head Cleaner Assembly) by pushing the Locking Tab.(B) outward.
2) Remove the Cleaner Upper Spring and then remove the Cleaner Upper Arm Sub Assembly.
3) Remove the Cleaner Spring.

*** NOTE**

1) When reassembling, do not touch the Video Head Tip with fingers or tools.

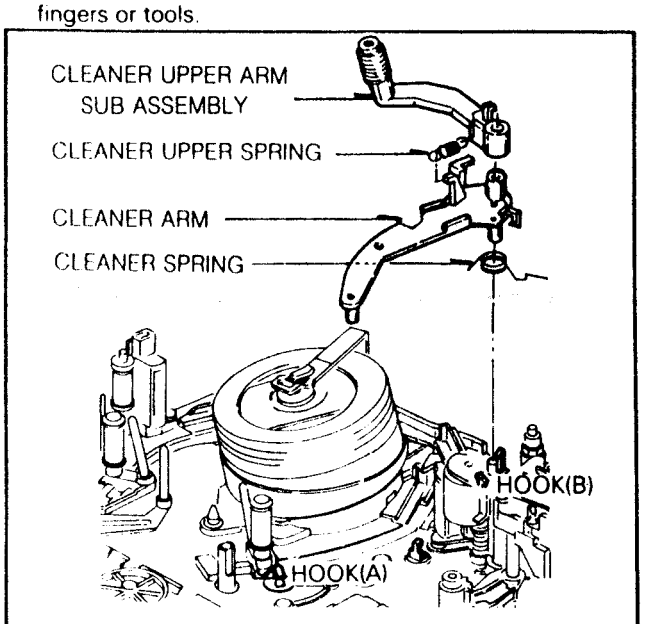


Fig. B-1 Auto Head Cleaner Assembly

2. Drum Assembly and Drum Base(Fig. B-2)

1) Remove the Auto Head Cleaner Assembly. (Option)
2) Unplug the connector with the Deck Mechanism Assembly turned over.
3) Loosen the screw(A) and then lift up the Drum Brush.
4) Remove two screws(B) and then lift up the Drum Assembly and Drum Base from the Deck Mechanism Assembly.
5) Separate the Drum Assembly from the Drum Base by Loosening three screws(C) on the back of Drum Base.

*** NOTE**

1) When disassembling and reassembling
① Do not touch the Video Head tip with fingers or tools. (Give special attention to disassembling and reassembling of Auto Head Cleaner Assembly)
② After reinstalling the Drum Brush, the Drum Brush should be aligned with the center of vertical axis of Drum Assembly.
③ After completing the reassembly, adjust the transportation system and the Servo P.G.

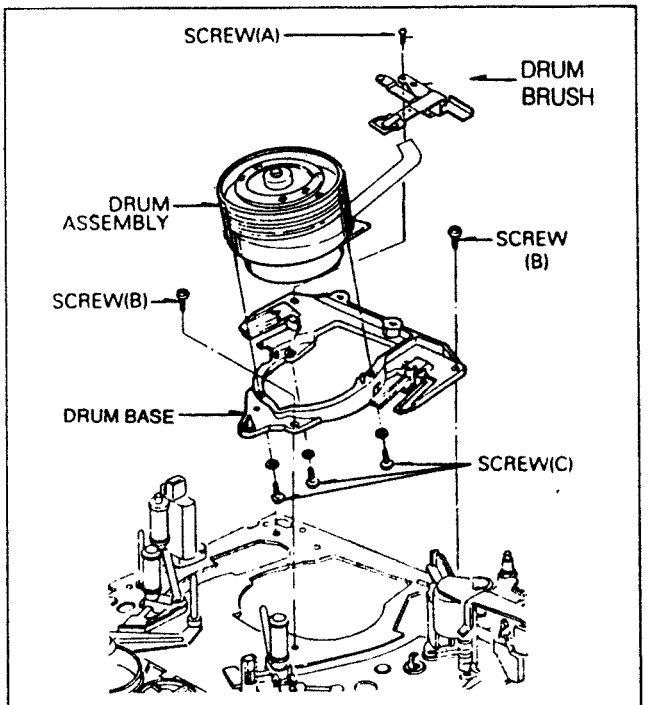


Fig. B-2 Drum Assembly/Drum Base

3. Drum Assembly

3-1. Drum Sub and Motor Assembly (Fig. B-3-1)
: New Type (No two screws and P.C.B on the Drum)

1) Remove the Drum Base from the Deck Mechanism Assembly.
2) Separate the Drum Assembly from the Drum Base.
3) Remove two screws(A) and then remove the rotor.
4) Remove three screws(B) and then remove the stator.

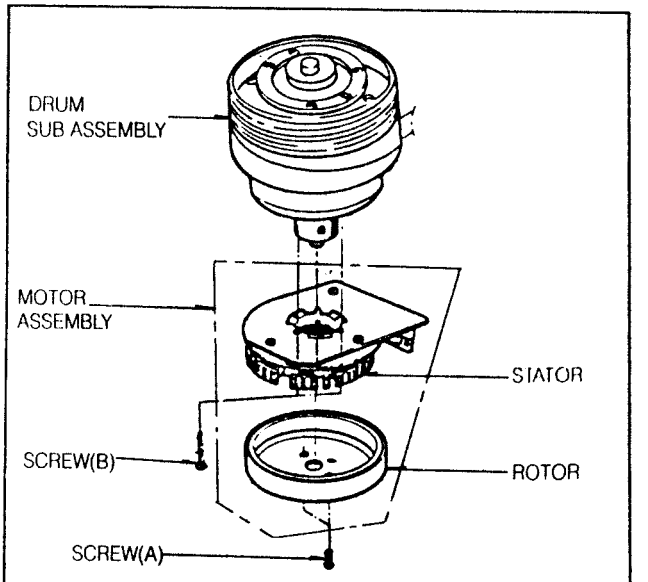


Fig. B-3-1 Drum Sub and Motor Assembly

*** NOTE**

1) When disassembling and reassembling
① Do not touch the Video Head Tip with fingers or tools.

3-2. **Upper and Lower Drum Assembly (Fig. B-3-2)**
: Old Type (There are two screws and P.C.B on the Drum)

1) Remove the Drum Assembly and Drum Base from the Deck Mechanism Assembly.
2) Separate the Drum Assembly from the Drum Base.
3) Remove two screws(A).
4) Remove the P.C.B.
5) Separate the upper Drum Assembly from the Lower Drum Assembly.

*** NOTE**

1) When disassembling and reassembling
① Do not touch the Video Head Tip with fingers or tools.
② Make sure that the color(white) marked on the P.C.B of the upper Drum should coincide with the color(Green) marked on the Flange Assembly.

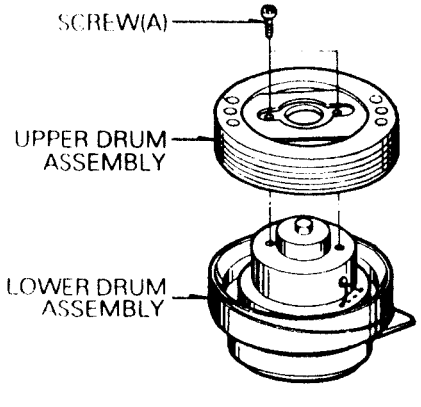


Fig. B-3-2 Upper/Lower Drum Assembly

4. A/C(Audio/Control) Head Assembly (Fig.B-4)

1) Unplug the connector
2) Remove the Nut(A), and then lift up the A/C Head Assembly.
3) Remove the Azimuth Adjusting Screw.
4) Remove two screws(B),(D) and then separate the A/C Head Assembly from the Base A/C Head Assembly.

*** NOTE**

1) When disassembling
① First of all, release the spring A/C.
② Do not touch the A/C Head Tip with fingers or tools.
③ After reinstalling the Audio Control Head Assembly, adjust the Tilt, Azimuth and Height of A/C Head.

5. Pinch Lever Assembly(Fig. B-5)

1) Remove one Nut, and then remove the Dew Bracket.
2) Lift up Pinch Lever Assembly.
3) Remove the Pinch Spring, and remove the Pinch Lever.
4) Remove the Stopper Spring and remove the Pinch Stopper by lifting it up when the Hook of Pinch Stopper is aligned with the hole of Pinch Arm while rotating the Pinch Stopper in the counterclockwise direction.
5) Remove the Pinch Cap, and then remove the Pinch Roller Assembly.

*** NOTE**

1) When disassembling and reassembling
① Be careful not to get any foreign substance on the Roller.
② When disassembling the Pinch Cap, be careful not to damage the Pinch Arm.

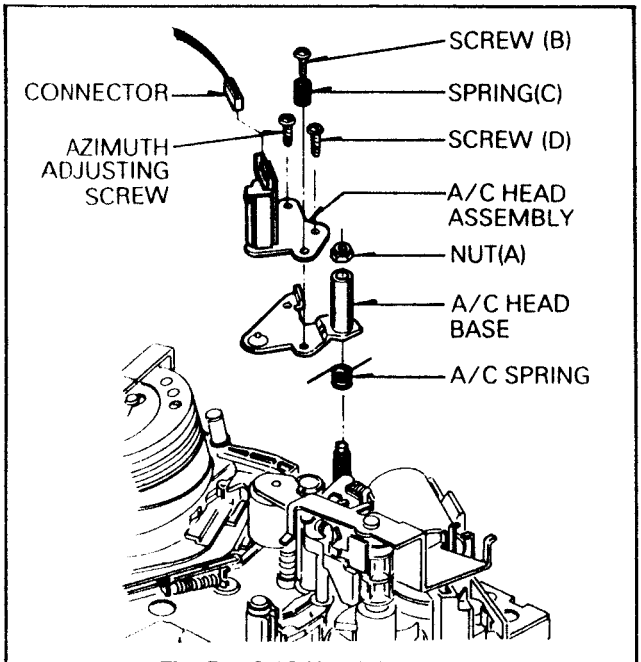


Fig. B-4 A/C Head Assembly

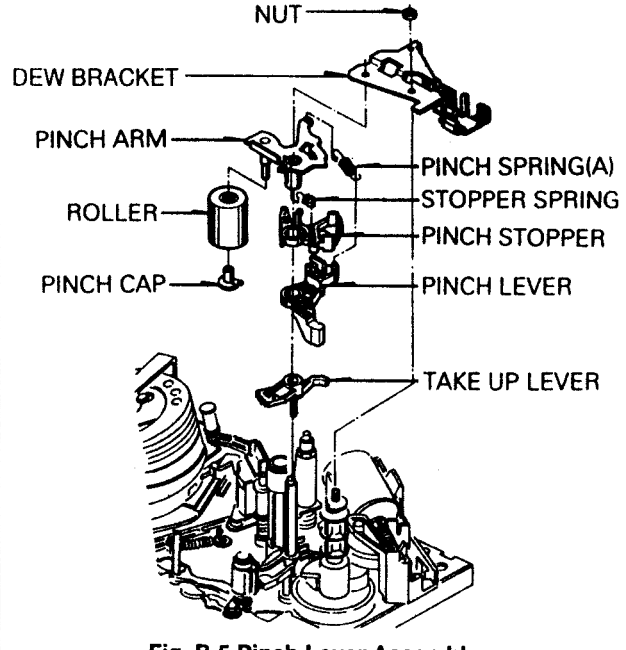


Fig. B-5 Pinch Lever Assembly

6. Loading Motor Assembly(Fig. B-6-1, B-6-2)

1) Remove the Dew Bracket.
2) Unplug the connector from the Junction P.C.B Assembly
3) Remove two screws(A).
4) Remove the worm wheel by pushing it down.
5) Remove the Loading Motor Assembly by pushing(C) and (D) outward.
6) Remove the worm Gear Assembly from the Loading Motor Assembly by pushing it.

*** NOTE**

1) When reassembling

(1) Make sure that the worm assembly is seated in the axis of Loading Motor.

(2) Two grooves(G) of Loading Motor should be turned up and two projections(F) of Bracket Assembly should be seated in each at the two holes(E)(Fig. B-6-1).

(3) Take notice of the polarity of the Loading Motor.

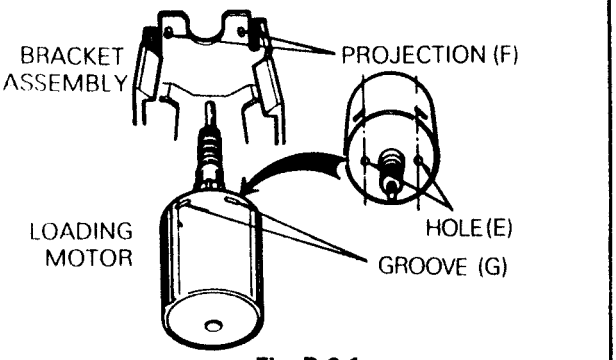


Fig. B-6-1

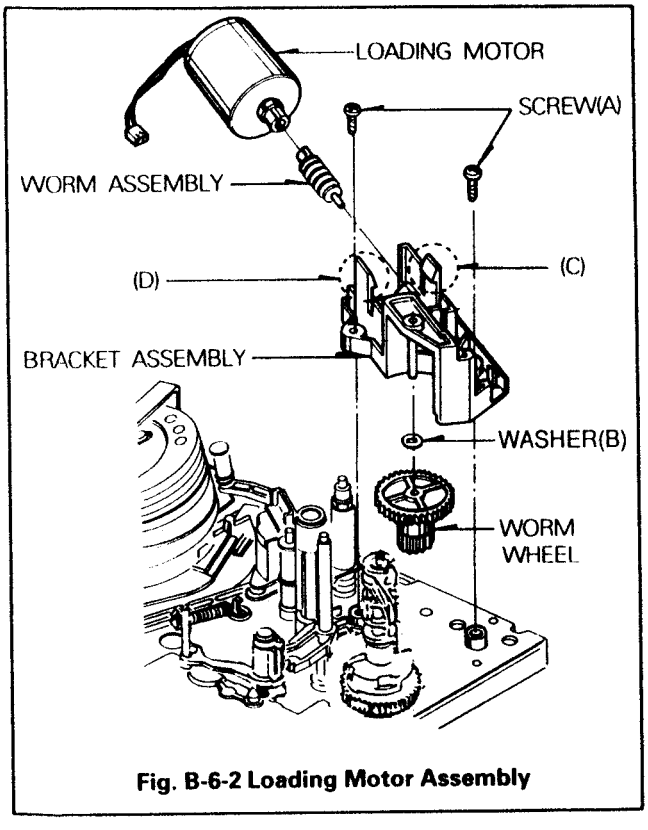


Fig. B-6-2 Loading Motor Assembly

7. Take Up Lever(Fig. B-7)

1) Remove the Loading Motor Assembly.
2) Remove the Dew Bracket(Fig. B-5).
3) Remove the Pinch Lever Assembly(Fig. B-5).
4) Keep the Pinch Gear turned in the clockwise direction (180°).
5) Remove the Take-Up Lever by pushing the hook(A) outward.

*** NOTE**

1) When disassembling and reassembling

(1) When disassembling the Take-Up Lever, be careful not to break the Hook(A).

(2) When reassemble the Take-Up Lever,align the appendant Gear of Lever Take-Up with the appendant Gear of Take-up Arm

(3) Reassemble the Take-Up Lever completely by hooking (A).

(4) Be sure to replace together Take-Up Lever and Pinch Gear.

(5) Be sure to assemble Pinch Lever Assembly before operating.

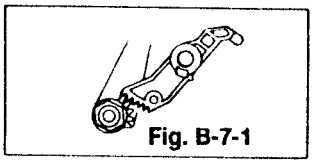


Fig. B-7-1

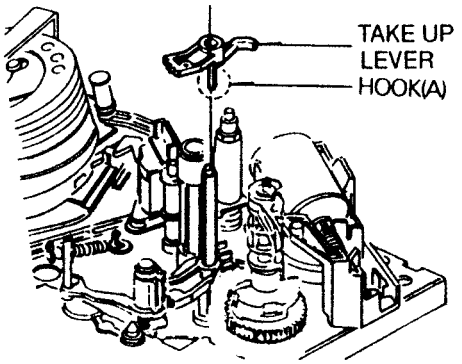


Fig. B-7. Take-Up Lever

8. Take Up Arm Assembly(Fig. B-8)

1) Remove the Loading Motor Assembly.
2) Remove the Dew Bracket, Pinch Gear, and the Take-Up Lever.
3) Remove one Washer(A).
4) Remove the Take-Up Arm Assembly by lifting it up.
5) Remove the spring(B).

*** NOTE**

1) When reassembling

(1) Align the Gear of Take-Up Arm with the Gear of Take-Up Lever(Fig. B-7-1).

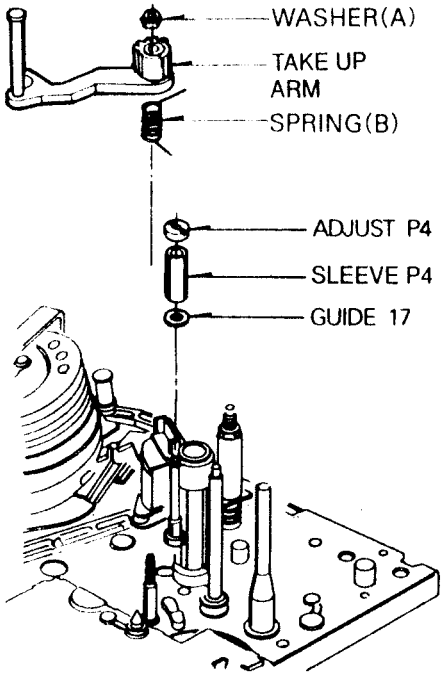


Fig. B-8 Take-Up Arm Assembly/P4

9. P4 Assembly(Fig. B-8)

1) Remove the Adjust P4.
2) Remove the Sleeve P4.
3) Remove the Guide 17.

10. Pinch Gear(Fig. B-10-1, B-10-2)

1) Remove the Loading Motor Assembly.
2) Remove one Nut(A) and then remove the Dew Bracket (Fig. B-5).
3) Remove the Pinch Lever Assembly by lifting it up(Fig. B-5)
4) Keep the Pinch Gear turned in the clockwise direction (180°).
5) Remove the Take-Up Lever by pushing the hook(A) outward(Fig. B-7).
6) Keep the Pinch Gear turned in the counterclockwise direction (180°).
7) Remove the Pinch Gear Assembly.

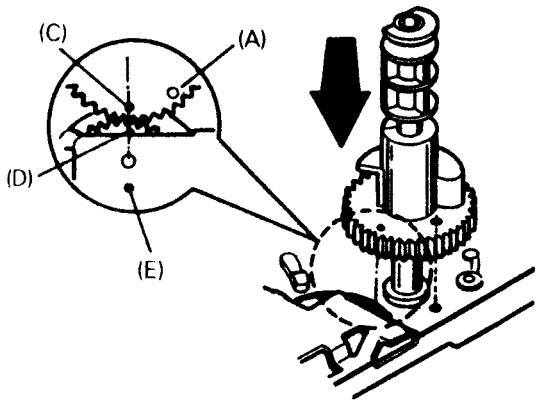


Fig. B-10-2 Pinch Gear

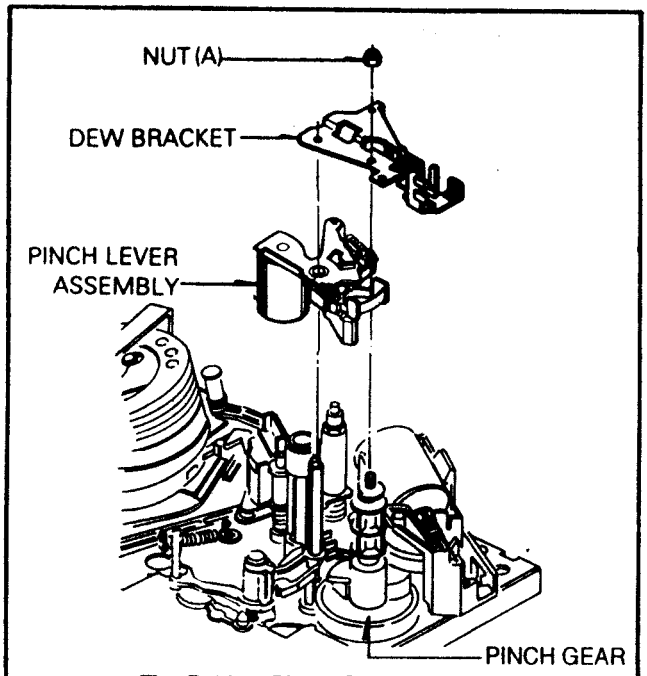


Fig. B-10-1 Pinch Gear Assembly

*** NOTE**

1) When reassembling, align the hole(A) of Pinch Gear with the hole of chassis, and the hole(C) of Pinch Gear with the groove(D) of the P.C.Gear. Hole(E) of chassis should be aligned with the hole of P.C.Gear.
2) Be sure to replace together Take-Up Lever and Pinch Gear.
3) Be sure to assemble Pinch Lever Assembly before operating.

11. FE(Full Erase) Head Assembly(Fig. B-11) (Optional Item)

1) Unplug the connector.
2) Remove one screw(A), and then remove the FE Head.

*** NOTE**

1) When disassembling and reassembling
① Do not touch the Video Head Tip with fingers or tools.

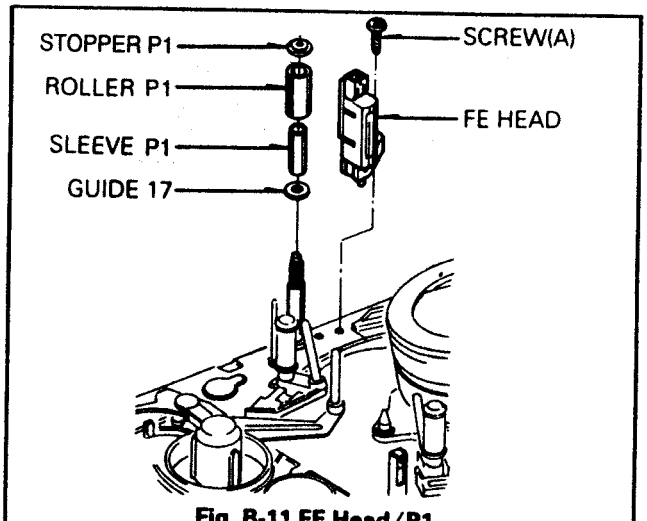


Fig. B-11 FE Head/P1

12. P1 Assembly(Fig. B-11)

1) Remove the Stopper P1.
2) Remove the Roller P1 .
3) Remove the Sleeve P1.
4) Remove the Guide 17.

13. Tension Arm Assembly(Fig. B-13)

1) Remove one screw(C).
2) Remove the Tension Spring.
3) Remove the Tension Arm Assembly by pushing hooks outward with the Deck Mechanism Assembly turned over.
4) Remove the Tension Band Assembly from the Tension Arm by pushing Hooks of Holder(A).

• NOTE

1) When disasembling and reassembling, give special attention to the disassembling and reassembling of Tension Arm Assembly, because the Tension Band is interposed between the Supply Reel and the Soft Brake.

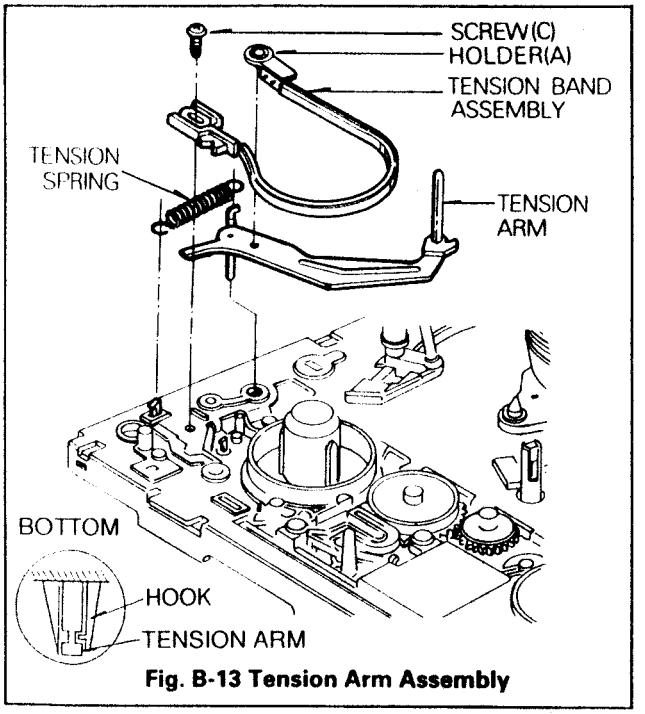


Fig. B-13 Tension Arm Assembly

14. Supply Soft/Supply Main/Take-Up Soft /Take-Up Main Brake Assembly

1) Supply Soft Brake(SSB)
   ① Remove the SSB Spring.
   ② Remove the SSB.
2) Supply Main Brake(SMB)
   ① Remove the SMB Spring.
   ② Remove the SMB.
3) Take Up Soft Brake(TSB)
   ① Remove the TSB Spring.
   ② Remove the TSB.
4) Take-Up Main Brake(TMB)
   ① Remove the TMB Spring.
   ② Remove the TMB.

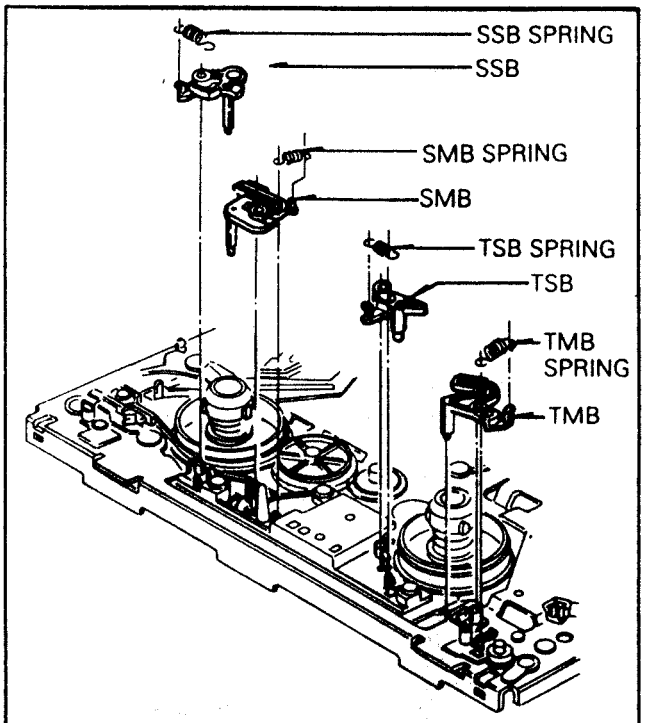


Fig. B-14 SMB/SSB/TMB/TSB

15. Bracket F/R(FF/Rewind) Assembly (Fig. B-15)

1) Remove the TMB.
2) Remove the Washer(A), and then remove the Gear F.R.
3) Remove three screws, and then remove Bracket F/R Assembly from the Deck Mechanism Assembly.
4) Remove the Washer(B), and spring Up/D, and then remove the Gear Up/D.
5) Remove the shaft(C), and then remove the Arm F.R, Lever F.R and Spring F.R.

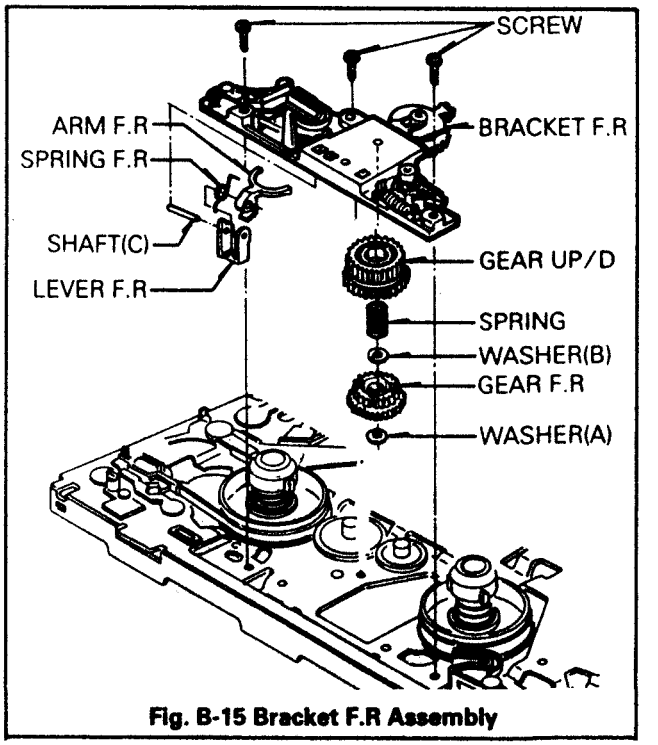


Fig. B-15 Bracket F.R Assembly

16. Supply Reel Assembly(Fig. B-16)

1) Remove the Tension Band Assembly.
2) Remove the Bracket F/R.
3) Lift up the Supply Reel Assembly from the Deck Mechanism Assembly.

17. Take Up Reel Assembly(Fig. B-16)

1) Remove the TMB(Fig. B-14)
2) Lift up the Take-up Reel Assembly from the Deck Mechanism Assembly.

*** NOTE**

1) When reassembling
① Make sure that the Supply and Take Up Reel are not exchanged.
② After reinstalling the Supply Reel Assembly, Adjust the Tension.

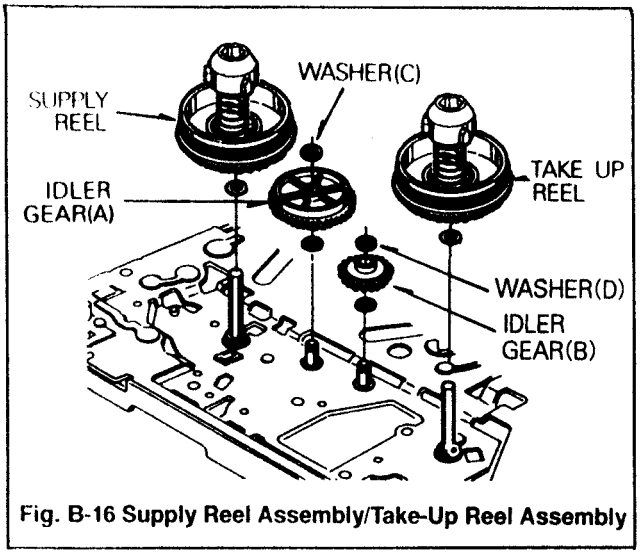


Fig. B-16 Supply Reel Assembly/Take-Up Reel Assembly

18. Idler Gear(A), (B)(Fig. B-16)

1) After removing the Supply Reel and supply Main Brake Assembly, remove the washer(C) and then remove the Idler Gear(A).
2) Remove the Washer(D) and remove the Idler Gear(B).

19. Pulley Gear Assembly(Fig. B-19)

1) Turn over the Deck Mechanism Assembly.
2) Remove the Capstan Belt.
3) Remove the Washer(A) and lift up the Pulley Gear.

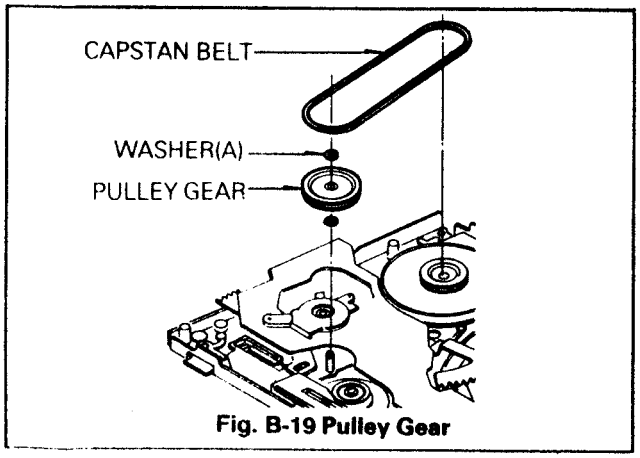


Fig. B-19 Pulley Gear

20. Bracket Bottom Assembly(Fig. B-20)

1) Remove one screw(A).
2) Remove one Hexagonal Nut, and then lift up the Bracket Bottom Assembly.
3) Remove one Washer(C), and lift up the Ratchet Gear 1.
4) Remove the washer(D), and then remove Ratchet Gear 3 from the Bracket Bottom.

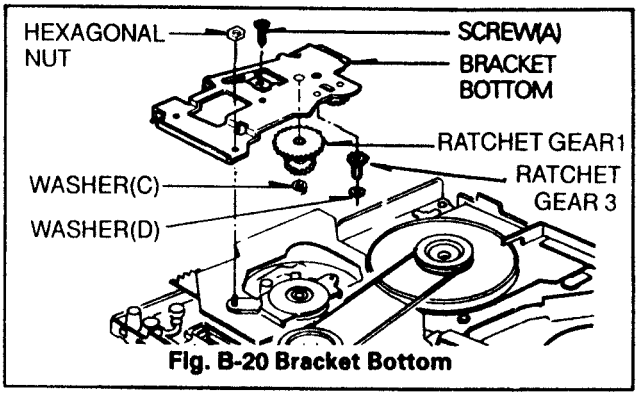


Fig. B-20 Bracket Bottom

21. Junction PCB(Printed Circuit Board) Assembly(Fig. B-21-1)

1) Remove the Bracket Bottom Assembly.
2) Remove two screws(A), (B) and then remove the Junction P.C.B Assembly.
3) Remove the Mode Switch from the Junction P.C.B Assembly.
4) Remove the Reel Sensor, Sensor LEDS and each holder from the Junction P.C.B(Fig. B-21-2).

*** NOTE**

1) When reassembling the Mode Switch, the groove(V) and (U) of Mode Switch should be at their original place in the Eject Mode.

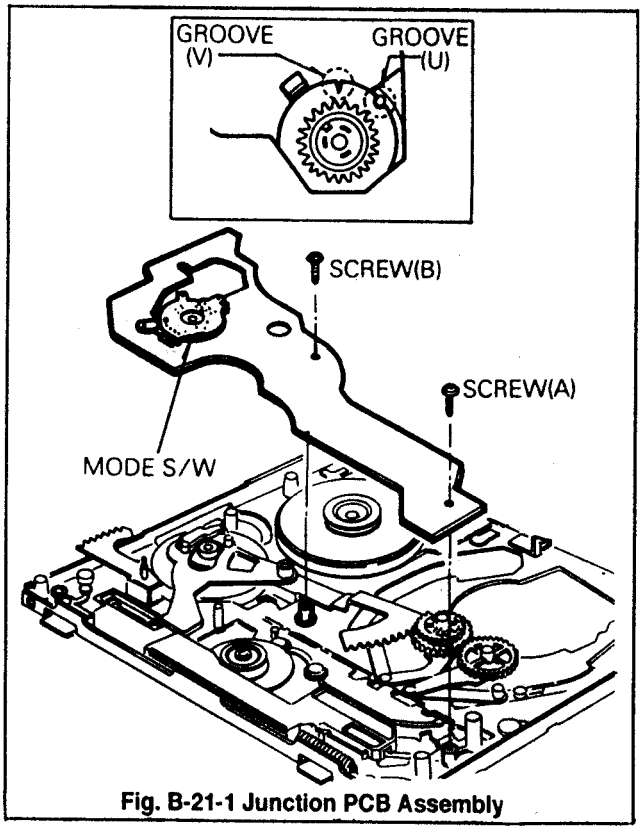


Fig. B-21-1 Junction PCB Assembly

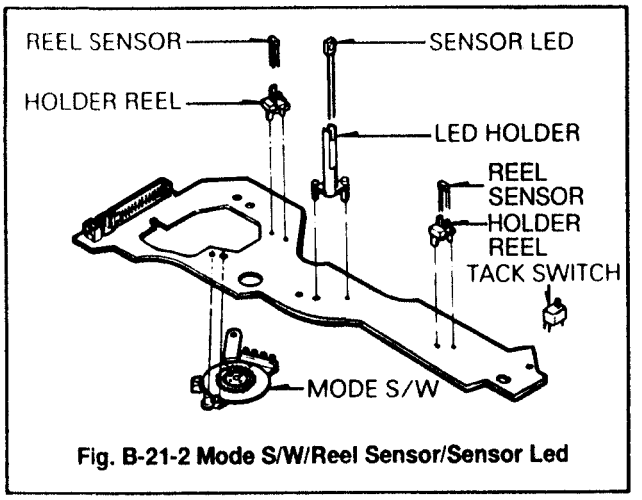


Fig. B-21-2 Mode S/W/Reel Sensor/Sensor Led

22. Capstan Motor and Brake Assembly (Fig. B-22-1)

1) Remove the Junction P.C.B Assembly
2) Hook the end of Capstan Brake Spring to the projection of Capstan Brake and then remove the Capstan Brake Assembly by lifting it up(Fig. B-22-2).
3) Remove two Screws(A), and then remove the Bracket C-Guide.
4) Remove the Connector.
5) Remove three screws(B), and then remove the Capstan Motor Assembly from the Deck Mechanism Assembly.

*** NOTE**

1) When disassembling and reassembling, hook end of the spring on the projection of Cap-Brake and remove it by lifting it up. Reassemble it in the opposite manner.

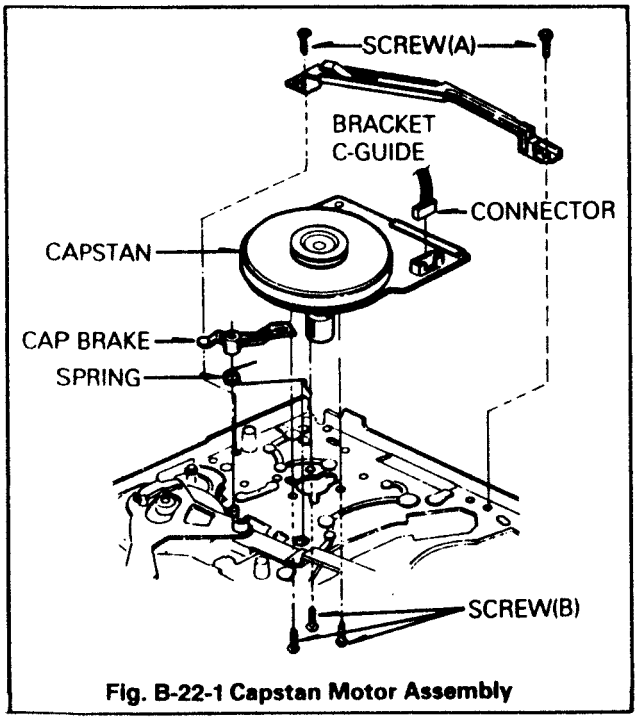


Fig. B-22-1 Capstan Motor Assembly

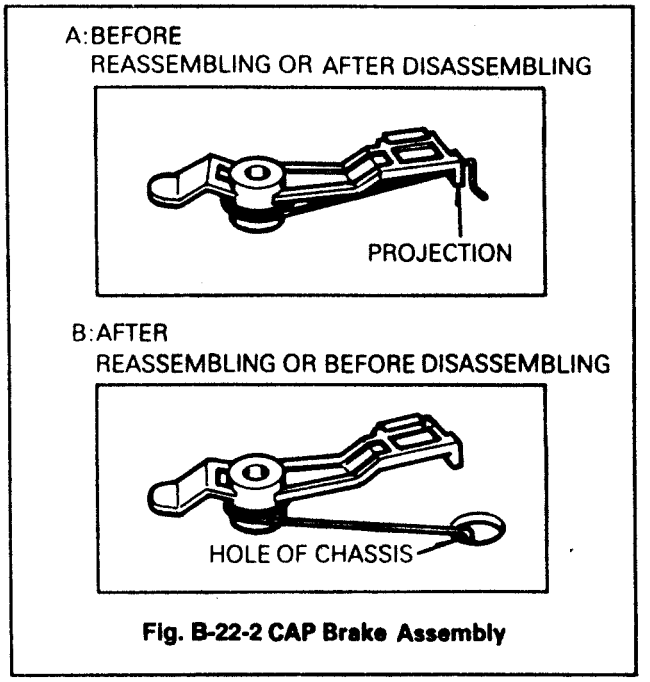


Fig. B-22-2 CAP Brake Assembly

23. Function Plate(Fig. B-23)

1) Remove two screws(B) in Eject Mode.
2) Remove the Function Plate Spring.
3) Push the Function Plate in the direction of arrow(A) and then lift it up.

*** NOTE**

1) When reassembling,the groove of Lower part of Function Plate should be aligned with the shaft of Tension Lever Assembly(Fig. B-29).

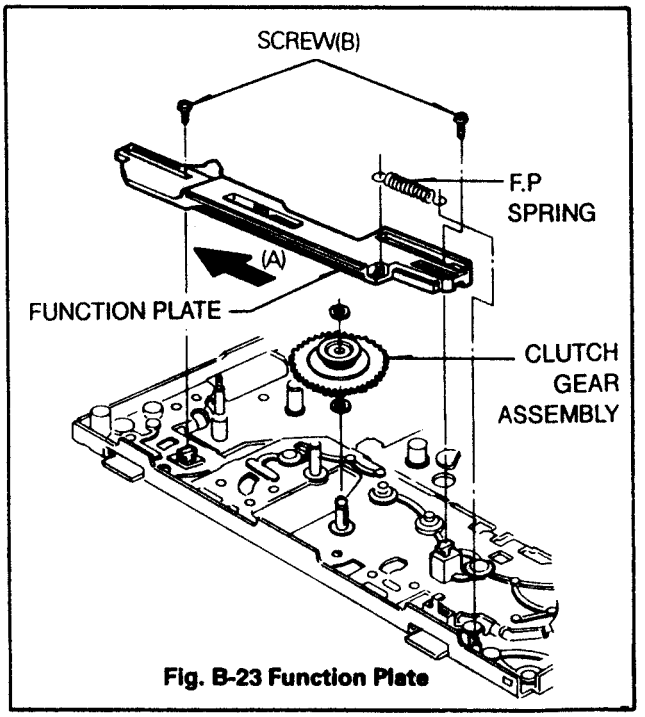


Fig. B-23 Function Plate

24. Ratchet Lever Assembly(Fig. B-24)

1) Remove the Function Plate.
2) Remove the Junction P.C.B Assembly.
3) Remove the Washer(A) and then remove the Ratchet Lever Assembly.
4) Remove the Ratchet Spring.
5) Remove the Ratchet Lever from the Ratchet 17 by lifting it up when the hook of it is aligned with the hole of Ratchet 17 while rotating it counterclockwise direction.
6) Remove the Washer(B), and turn over the Ratchet 17 and then remove the F-Lever Pin, Spring F-Lever.

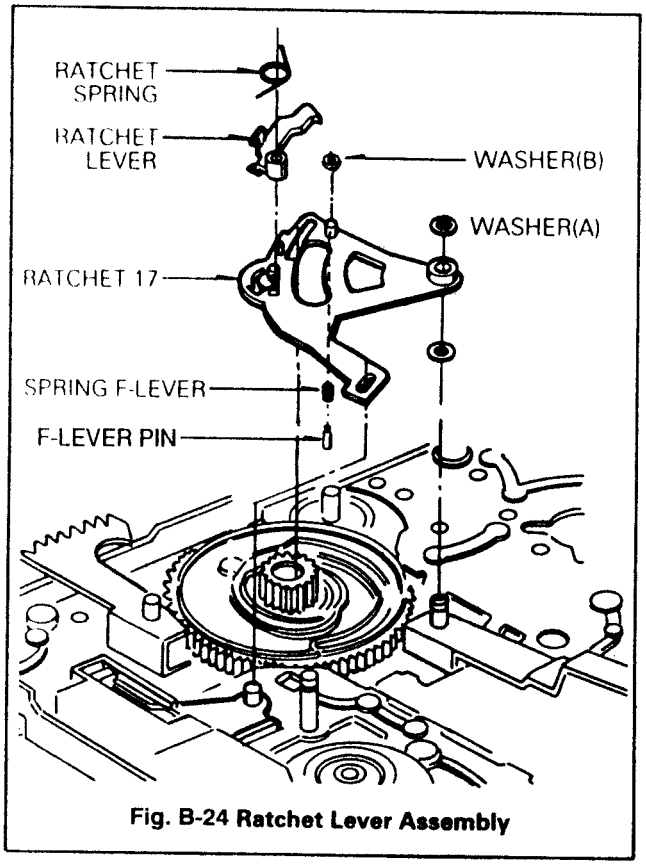


Fig. B-24 Ratchet Lever Assembly

25. Cam Gear/Rack Gear T/Rack Gear FL(Fig. B-25-2)

1) Remove the washer(A) and remove the Ratchet Lever Assembly.(Fig. B-25-1).
2) Remove the washer(B), and then remove the Cam Gear (Fig. B-25-2).
3) Remove the Rack Gear F.L.(Fig B-25-3).
4) Remove the Washer(D).(Fig. B-25-3).
5) Remove the Rack Gear T.(Fig. B-25-3).

*** NOTE**

1) When reassembling
(1) Align the Projection of Rack Gear T with the hole of Loading Gear.
(2) Drive the Rack Gear F.L in the direction of arrow(D).
(3) Hole of Cam should be aligned with the hole of chassis, and the groove(■) of Cam Gear should be aligned with the hole of PC Gear (Fig. B-26).

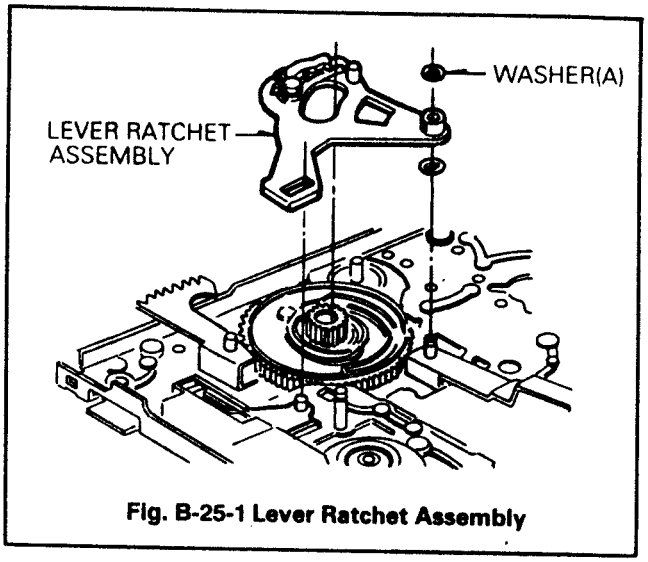


Fig. B-25-1 Lever Ratchet Assembly

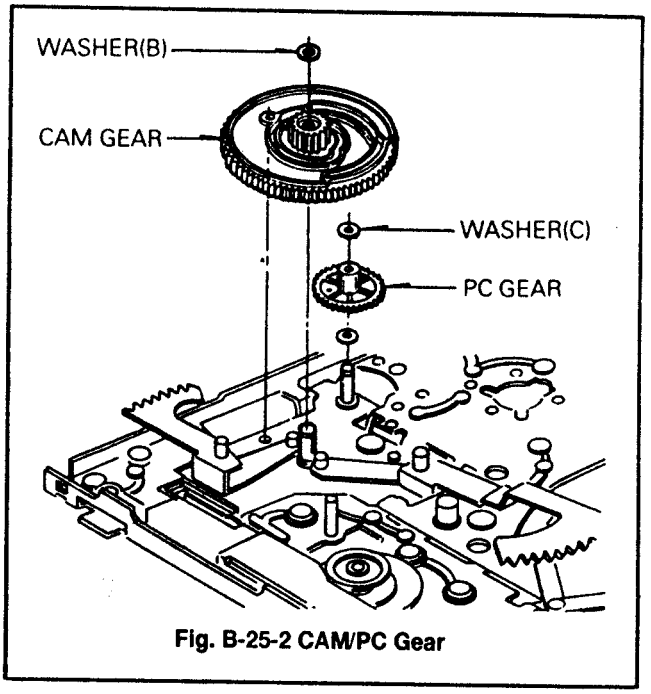


Fig. B-25-2 CAM/PC Gear

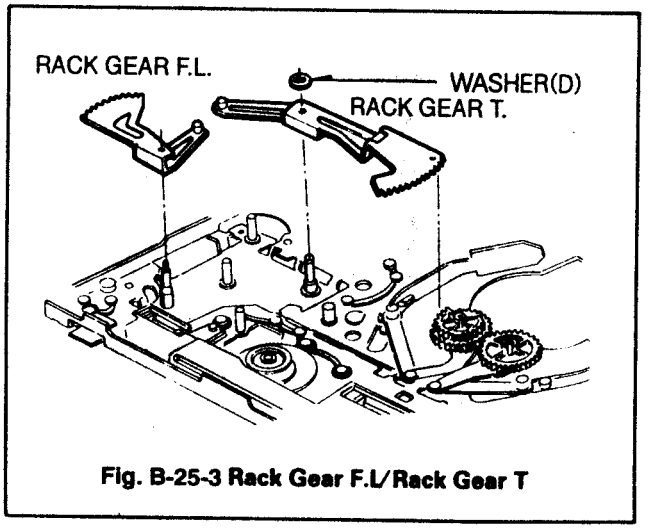


Fig. B-25-3 Rack Gear F.L/Rack Gear T

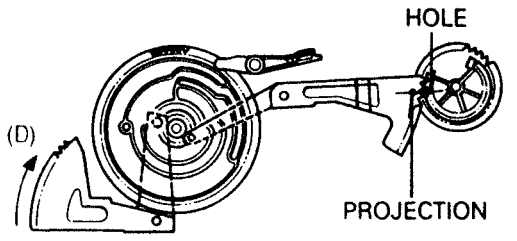


Fig. B-25-4 Rack Gear F.L/Rack Gear T/CAM Gear

26. PC Gear(Fig. B-26)

1) Remove the washer(C).
2) Remove the P.C Gear by lifting it up.

*** NOTE**

1) When reassembling

① The Groove of PC Gear should be aligned with the groove(V) of Cam Gear, and another hole of it should be aligned with the hole of chassis (Fig. B-26).

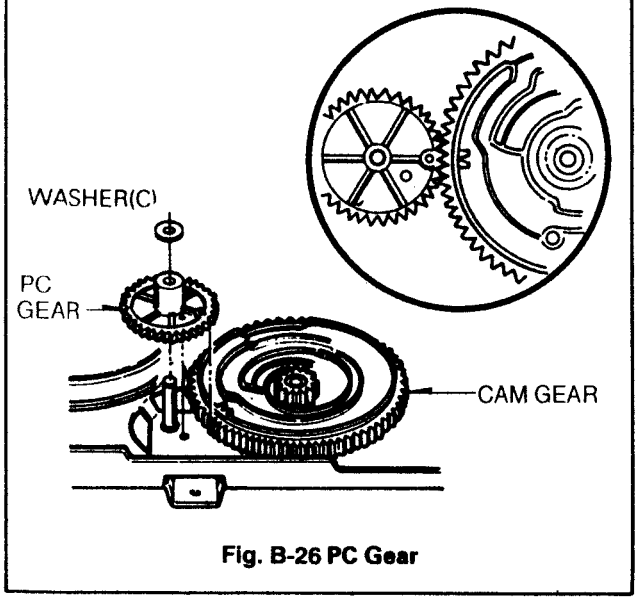


Fig. B-26 PC Gear

27. P2 and P3 Slant Assembly (Fig. B-27)

1) After finishing the disassembly of Drum Assembly, remove the P2 and P3 Slant Assembly by turning the Loading Gear(R) in the clockwise direction.(Loading direction)
2) Loosen the set screws.
3) Remove the Roller Guide from the Slant Base.

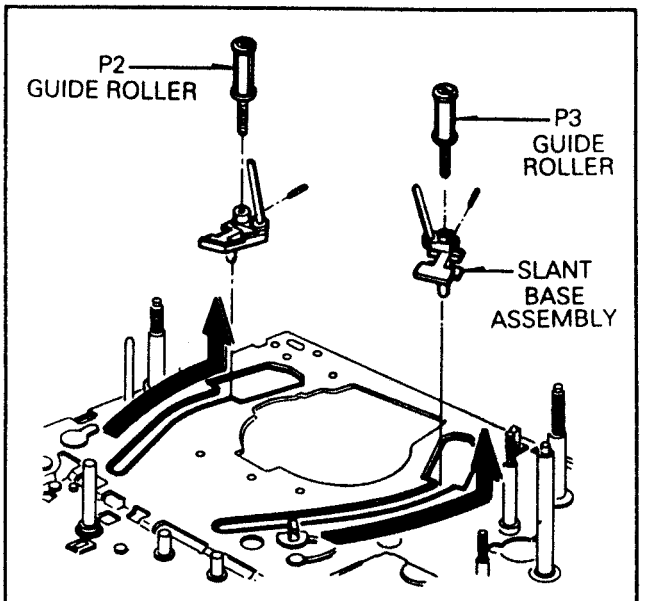


Fig. B-27 Slant Assembly

*** NOTE**

1) When disassembling and reassembling

① Use a Hexagonal wrench to remove set screw.
② Take notice that the P2 and P3 Slant Assembly should not be changed from their original place.

28. Loading Gear Assembly(L),(R) (Fig. B-28)

1) Remove the Cam Gear, Rack-T.
2) Remove the P2 and P3 Slant Assembly by turning the Loading Gear(L),(R) in the Loading direction
3) Lift up the Loading Gear Assembly(L),(R) from the Deck Mechanism Assembly.
4) Remove the Spring Load(L),(R).
5) Separate the Loading Gear(L), (R) from Arm Load(L), (R).

*** NOTE**

1) When reassembling

① Make sure that the Loading Gear(L) and (R) should not be changed from their original place.
② Align the groove of Loading Gear(L),(O) with the groove of Gear(R),(O).

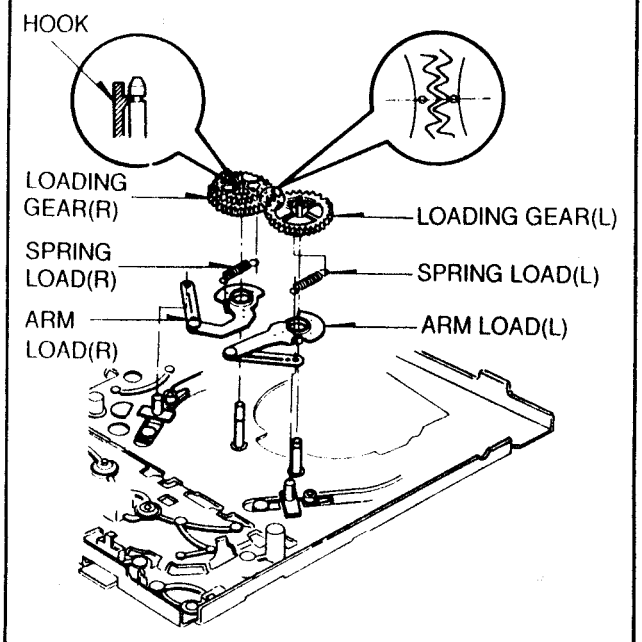


Fig. B-28 Loading Gear Assembly

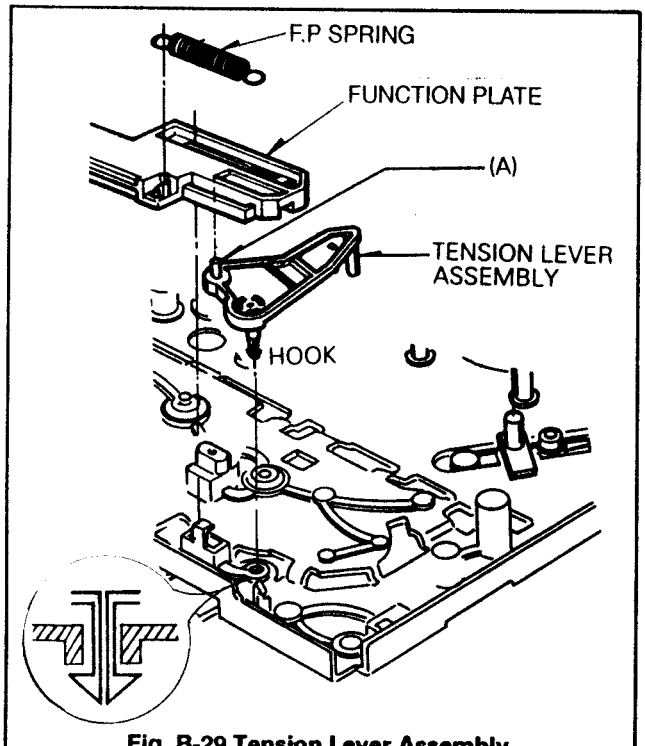


Fig. B-29 Tension Lever Assembly

29. Tension Lever Assembly (Fig. B-29)

1) Remove the Function Plate.
2) Remove the Tension Lever Assembly by pushing hooks inward.

*** NOTE**

1) When reassembling

① Set the part(A) of Tension Lever Assembly in the groove of Lower part of Function Plate.

30. Clutch Gear Assembly (Fig. B-30)

1) Remove the Pulley Gear.
2) Remove the Plate Function.
3) Remove the washer(A), and then remove the Clutch Gear Assembly.

*** NOTE**

1) When reassembling

① Do not disassemble the Clutch Gear Assembly any futher, because Torque adjustment is not adjustible.

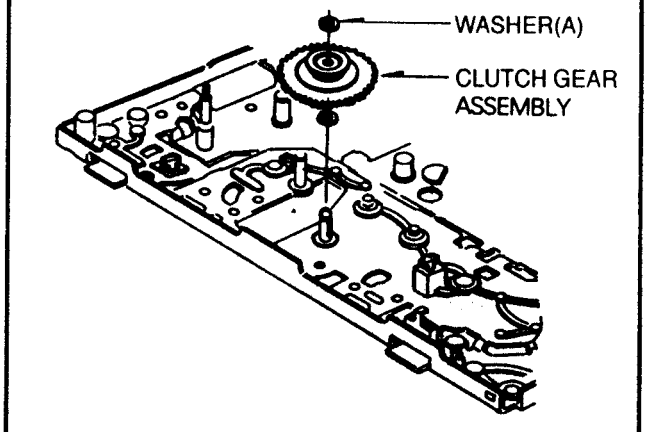
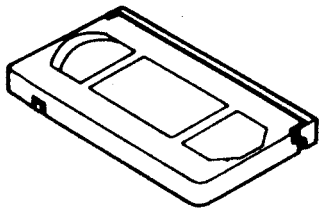
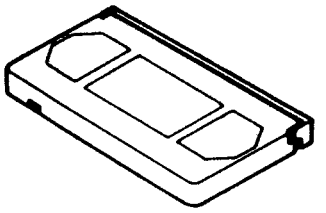
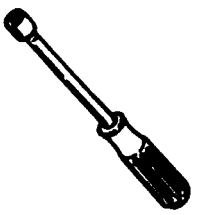


Fig. B-30 Clutch Gear Assembly

MECHANISM ADJUSTMENTS

• Tools and Fixtures for Deck

1. Back tension meter Parts No : D00-D006 	2. Alignment tape Parts No NTSC: DTN-0001 PAL : DTN-0002 	3. Torque gauge Parts No : D00-D002
4. Torque gauge adaptor Parts No : D09-R001 	5. Post height adjusting driver Parts No : DTL-0005 	6. M3 Nut driver Parts No : DTL-0006 

1. Mechanism State Switch (Mode Switch) Check

Purpose: To detect accurately the mechanism state and prevent the mechanism from malfunction.

Test Equipment/Fixture	VCR State	Check Point
● Blank tape	● Eject Mode (with cassette ejected)	● Mechanism state switch (Mode Switch and Cam)

Check Procedure

1) Turn the VCR on and eject the tape by pressing eject button.
2) Remove the Cabinet Top, the Main P.C.Board and the CST Housing. Then push the CST IN/OUT switch (Loca. #137) and eject button at the same time.
3) Turn the worm (Loca. #082) of Loading Motor Assembly (Loca. #A10) to the left side (counter-clockwise) to align the three holes (A) of the Pinch Gear, the P.C.Gear and the Chassis.
4) Remove the Bottom Cover and then check that the groove (V) and the hole (O) of Mode S/W are aligned each other. If the above alignment is not obtained, adjust as follows.
   (1) Remove the Bracket Assembly Bottom and the Capstan Belt in the state of power off.
   (2) Remove the P.C.B Assembly, align the groove (V) and the hole (O) of Mode S/W each other and then reassemble the P.C.B Assembly.
   (3) Turn the power on and perform the various operations to check that the loading and the unloading are correct.

Check Diagram

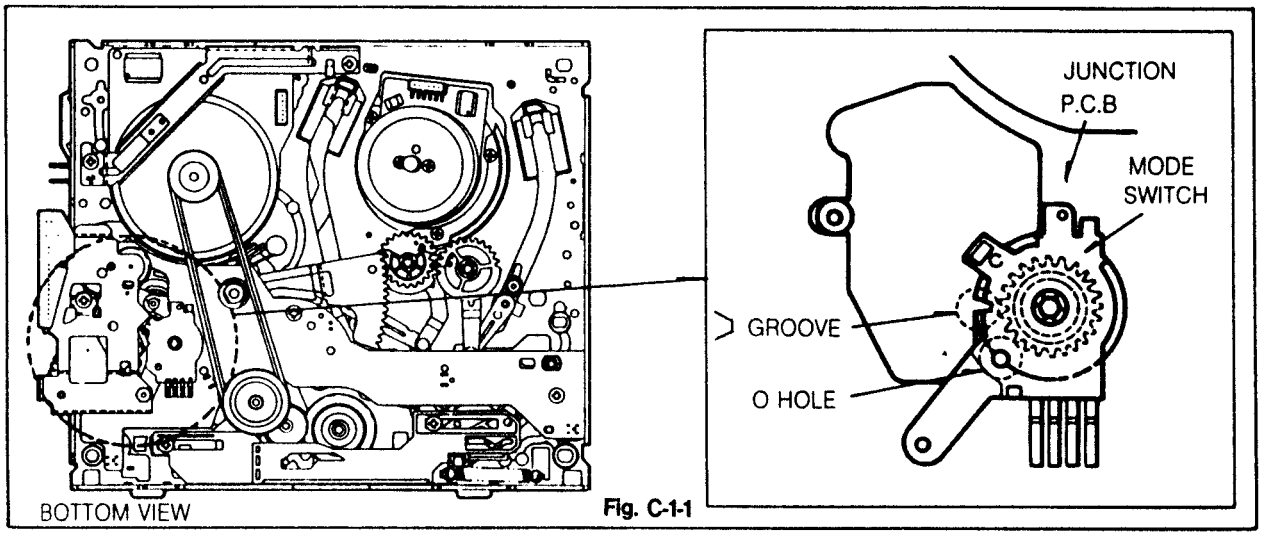


Fig. C-1-1

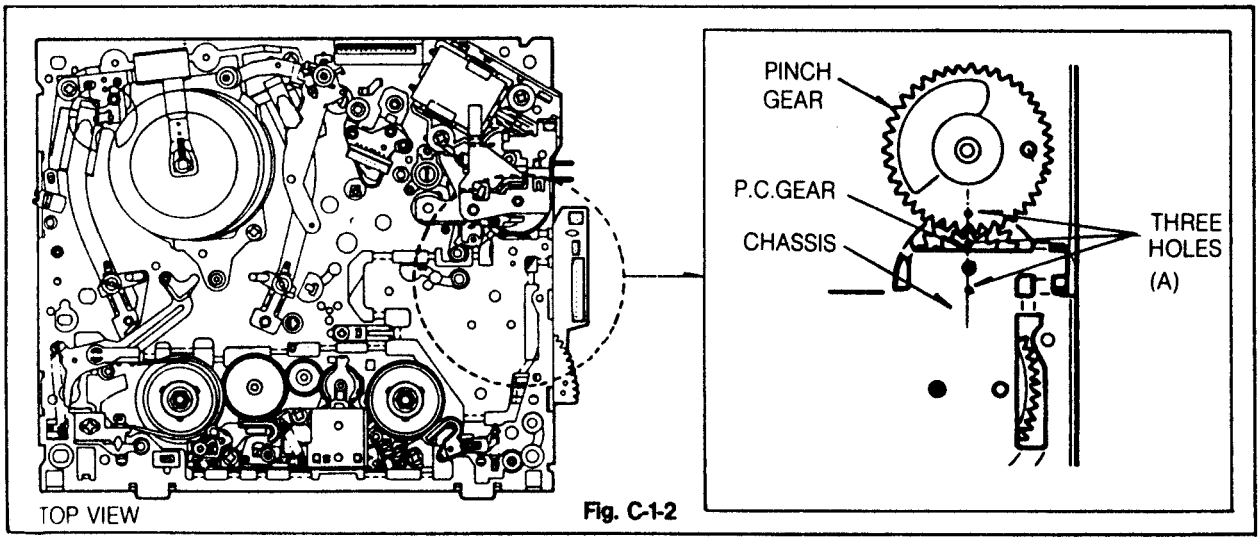


Fig. C-1-2

2. Preparation for Adjustment(To set VCR to the loading state without inserting a cassette)

1) Unplug the power cord from the AC outlet.
2) Remove the Cabinet Top and Front Loading mechanism.
3) Plug the power cord into the AC outlet.
4) Turn the VCR on and push the tact switch in the PCB Assembly.
   The VCR can accept input of each mode in this case. However the rewind and review operation cannot be performed for more than a few seconds because the take-up reel table is in the stop state and reel pulses cannot be detected.

(NOTE)

Always return the VCR to the Front Loading Mechanism Assembling State in the following order after the above operations have been performed.

1) Press the Eject button after turning the power on.
2) Wait for about 10 seconds until searching out the assembly position.
3) Assemble the Front Loading Mechanism and connect the Front Loading Mechanism Connector.
4) Refer to the "Front Loading Mechanism Disassembly" which is described previously.

3. Tension Post Position and Tension Adjustment

Purpose: To make the tension of tape constant so that the contact between the video heads and tape is stabilized.

Test Equipment/Fixture	VCR State	Adjustment Point
● Tension Meter (Tension adjustment)	● Play without cassette and with a Tension Meter	● Holder Band(B)

Adjustment Procedures

〈Position Adjustment〉

1) Perform loading without inserting a tape and loosen the screw that attaches the Holder Band(B) to the Deck Mechanism Assembly.
2) Insert the (-)type driver between the Holder Band(B) and the "V" groove of the chassis.
3) Move the Holder Band(B) right and left and align the center of tension post(Guide T-Post) with the center of P1(Shaft P1).(tolerance:Less than ±0.3mm)
4) Tighten the screw that attaches the Holder Band(B) to Deck Mechanism Assembly.

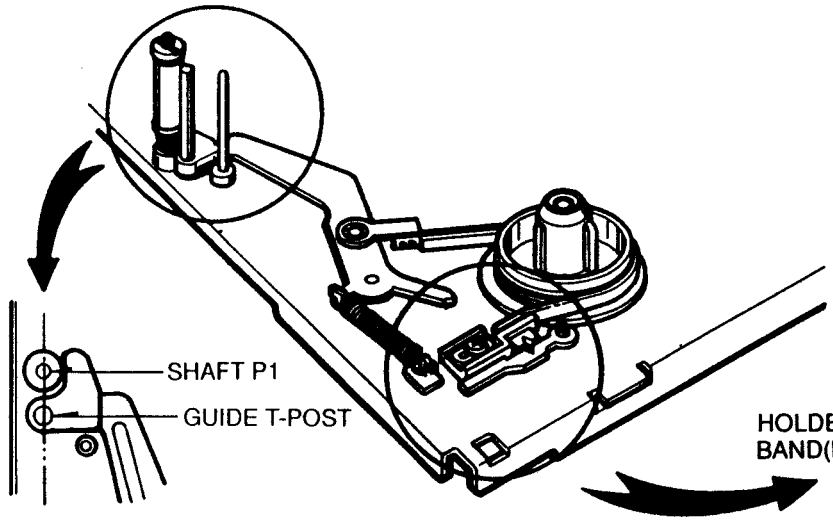
〈Tension Adjustment〉

1) Play the Tension Meter and read the Tension Meter: 38g•cm±4g•cm(reference value).
2) If the result is abnormal.
   (1) over the standard:loosen the screw, move the Holder Band(B) to the right a little and then tighten the screw and make sure that this adjustment is correct.
   (2) below the standard:loosen the screw, move the Holder Band(B) to the left a little and then tighten the screw and make sure that this adjustment is correct.

****CAUTION****

The range of movement of Holder Band(B) should be within ±1.5mm while being adjusted.
If the range is over, you should recheck the Reel Brake, Tension Arm and Spring.

Adjustment Diagram



ALIGN THE CENTER OF P1 AND TENSION POST

Fig. C-3-1

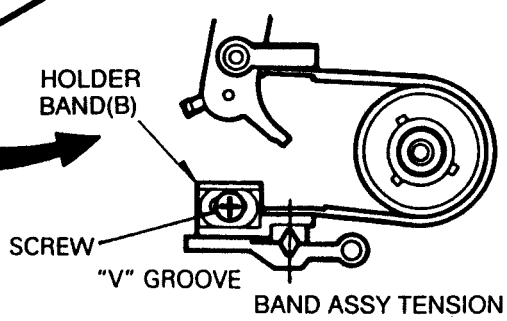


Fig. C-3-2

4. Checking Torque

Purpose: It is necessary to check the tension, torque and compression force at the tape take-up section and moving section to make the tape run smoothly and satisfy the basic performance of the VCR. Check these if the tape does not run smoothly or the tape speed is abnormal.

Test Equipment/Fixture	VCR state
● Torque Gauge ● Torque Gauge Adaptor ● Cassette Torque Meter SRK-VHT-063 : Play, Cue SRK-VHT-303 : Review	● Set the VCR to each operation mode without inserting a cassette. (See '2 Preparation for Adjustment')

Item	VCR Operation mode	Measurement Reel	Measurement Values
Main brake torque.	Eject	Supply and take-up reels	600g.cm or more
Slack removal torque	Unloading(power off)	Supply reel	120~220g·cm
Fast forward torque	Fast forward	Take-up reel	600g·cm or more
Rewind torque	Rewind	Supply reel	600g·cm or more
Play take-up torque	Play	Take-Up reel	90~150g·cm
Review Torque	Review	Supply Reel	120~180 g.cm
CUE Torque	Cue	Take-Up Reel	110~170 g.cm

Checking Method

The values are measured by using a torque gauge and torque gauge adaptor with the torque gauge fixed.

Note: This value is measured when the VCR is shifted in the unloading direction from the fast forward or rewind mode and quick braking is applied to both Reel Tables.

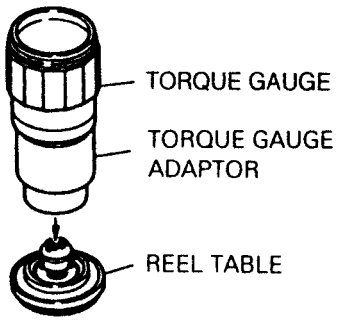


Fig. C-4

5. Guide Roller Height Adjustment

Purpose: To regulate the height of tape so that the bottom of tape runs along the tape guide line on the lower drum.

A. Preliminary Adjustment

Test Equipment/Fixture	VCR State	Adjustment Point
● Hexagonal Wrench or Bended Drive (+) Type ● Post Height Adjusting Driver	● Play an alignment tape	● Guide Roller Height Adjustment Screws on the Supply and Take-Up Guide Rollers.

Adjustment Procedure

1) Perform the precise adjustment.
2) When the Guide Roller is damaged, release the Guide Roller retaining screw and then replace the Guide Roller.

Adjustment Diagram

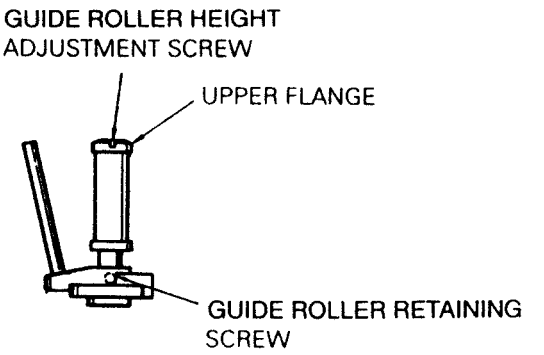


Fig. C-5-1

B. Precise Adjustment

Test Equipment/Fixture	Test Equipment Connection Points	VCR State	Adjustment Point
● Oscilloscope ● Post Height Adjusting Driver ● Alignment Tape(30HMP-2) ● Hexagonal wrench	● CH-1:PB RF Envelope ● CH-2 (NTSC : SW30Hz / PAL : SW25Hz) ● Head Switching Output Point ● RF Envelope Output Point	● Play an alignment tape	● Guide Roller Height Adjustment Screws.

Adjustment Procedure

1) Play an alignment tape after connecting the probe of the oscilloscope to RF Envelope Output Test Point and Head Switching Output Test Point.
2) Tracking control(in PB mode):Center position(When this adjustment is performed after the drum assembly has been replaced, set the tracking control so that the RF output is maximum.)
3) Height adjustment screw:Flatten the RF waveform.
4) Turn(Move) the tracking control(playback) clockwise and counterclockwise.(to the right and left)
5) Check that any drop of RF output is uniform at the start and end of the waveform.

****CAUTION****
If the adjustment is excessive or insufficient the tape is jammed or folded.

Waveform Diagrams

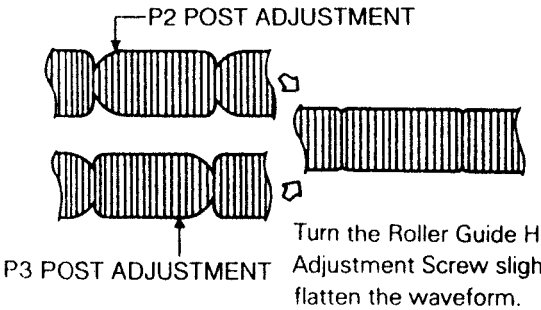


Fig. C-5-2

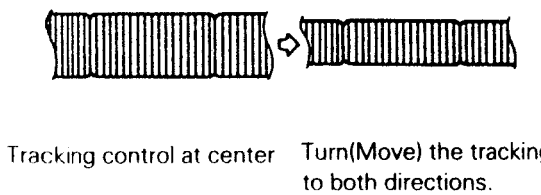
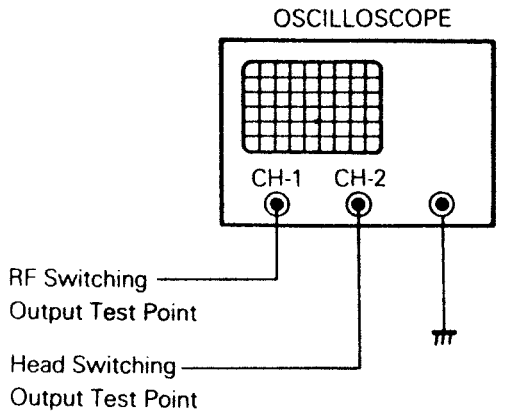


Fig. C-5-3

Connection Diagram



6. Audio/Control(A/C) Head Adjustment

Purpose: To keep the contact between the tape and head so that the specificed track is recorded and played back.

A. **Preliminary Adjustment** (Perform the preliminary adjustment, when there is no Audio Output signal with alignment tape.)

Test Equipment/Fixture	VCR State	Adjustment Points
● M3 Nut Driver		● Special screw ● Cone Point Screw for tilt ● Azimuth Adjustment Screw ● A/C Head Adjuster
● Blank tape	● Run the blank tape	

Adjustment procedure/Adjustment Diagram

1) Tighten the special screw so that the spring section protrudes 6.4mm(approx.) over the top of Head Base (1).

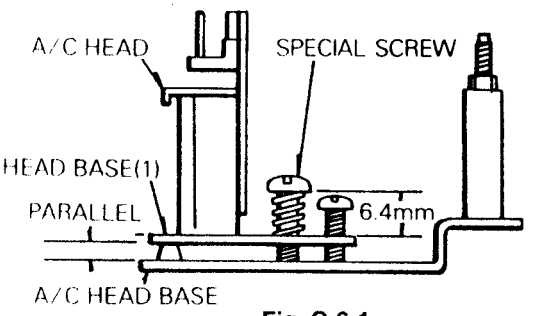


Fig. C-6-1

2) Turn the Azimuth Adjustment Screw and Cone Point Screw so that the Head Base(1) and A/C Head Base are parallel.

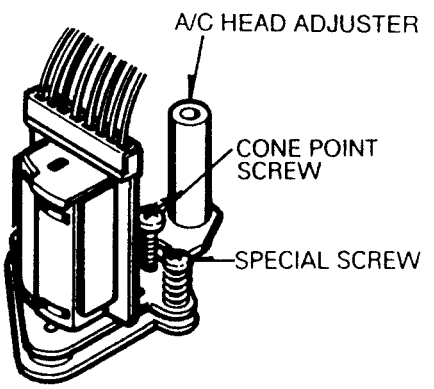


Fig. C-6-2

3) Load a blank tape and set the VCR to the play mode.

4) Confirm that the tape runs fittingly to the lower limit of the P4 post. Also confirm that the tape runs smoothly.

5) If adjustment is required, turn Cone Point Screw clockwise until curling is apparent at the lower edge of P4. Then turn Cone Point Screw counterclockwise until the curling smooths out.

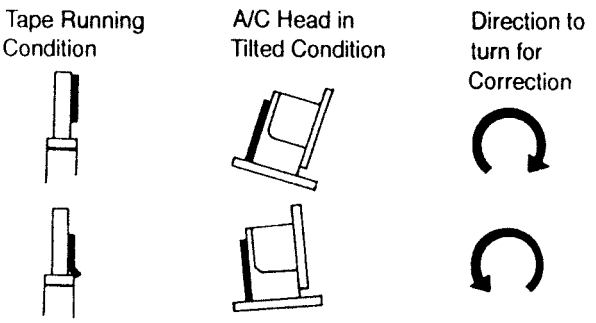


Fig. C-6-3

6) Check that there is no conspicuous curling and folding around the A/C head. If there is conspicuous curling or folding, readjust the Cone Point Screw, Azimuth Adjustment Screw and A/C Head Adjuster. When the bottom edge of tape is 0.20~0.25mm from the bottom edge of the control head's core, the height of A/C head is ideal.

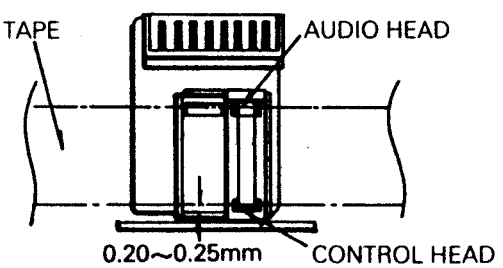


Fig. C-6-4

7) If necessary repeat steps 1 through 4 until a precise adjustment is achieved.

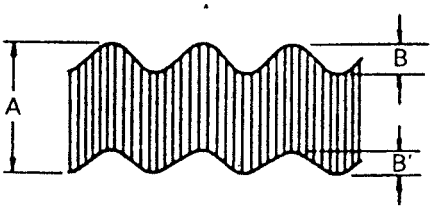
B. Precise Adjustment

Test Equipment/Fixture	Test Equipment Connection Point	VCR State	Adjustment Points
● Oscilloscope ● Alignment tapes ● M3 Nut Driver	● Audio output jack	● Play an alignment tape 1KHz, 7KHz sections	● Azimuth Adjustment Screw ● A/C Head adjuster ● Cone point screw

Adjustment Procedure

1) Connect the probe of oscilloscope to audio output jack.
2) Adjust the Azimuth Adjustment Screw, A/C Head adjuster and cone point screw slightly and alternately so that an Audio 1KHz output is maximum and flat. (minimum fluctuation).
3) Adjust the Azimuth Adjustment Screw slightly and alternately so that the Audio 7KHz output is maximum.

Waveform Diagram



A:Maximum BB':Minimum

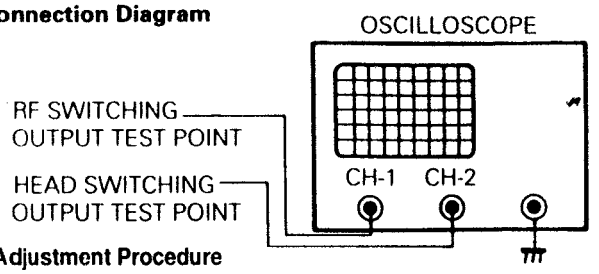
Fig. C-6-5

7. X-Value Adjustment

Purpose: To obtain compatibility with other VCRs.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
● Oscilloscope ● Alignment tapes ● Post Height Adjusting Driver	● CH-1:PB RF Envelope ● CH-2:SW 30Hz ● Head Switching Output Test Point ● RF Envelope Output Test Point	● Play an alignment tape	● Adjust X

Connection Diagram



Adjustment Procedure

1) Insert a cassette tape, and then "AUTO TRACKING" will be displayed on the Digitron, then push the Tracking ⊕ or ⊖ Keys one time as soon as possible to make the VCR release the Auto Tracking.
2) Turn the Adjust X to the maximum RF Envelope level when the VCR is free from the Auto tracking.
3) If RF envelope output is maximized from the center click position in the right direction (clockwise), set the tracking control to the center and turn the X Adjust counterclockwise.
4) If in the left direction (counterclockwise), turn it clockwise by the same method.
5) In case of the 30 μm, head will trace over a 60 μm width track, readjust it so that RF Envelope output begins falling at the same angle when tracking control is turned either left or right.

Adjustment Diagram

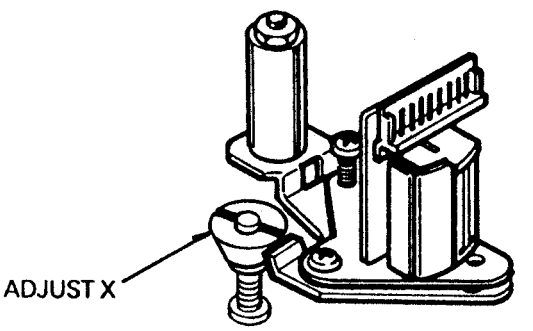


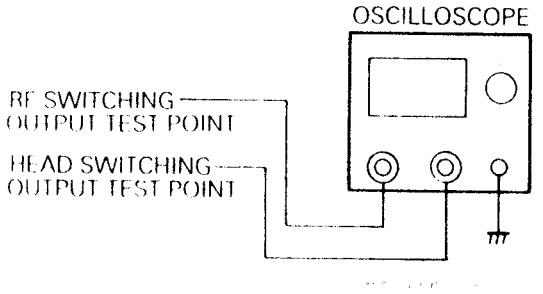
Fig. C-7

8. Adjustment after Replacing Drum Assembly(Video Heads)

Purpose: To suppress drift in the height relative to the Guide Roller and drift of the X Value after replacing the drum.

Test Equipment/Fixture	Test Equipment Connection Points	VCR State	Adjustment Points
● Oscilloscope ● Post Height Adjusting Driver ● Alignment tape ● Blank tape ● M3 Nut Driver	Checking the flatness ● CH-1 : PB RF Envelope ● CH-2 (NTSC : SW30Hz / PAL : SW25Hz) ● Head Switching Output Point ● RF Envelope Output Point	● Run the blank tape ● Play an alignment tape	● Guide Rollers Precise Adjustment ● Switching point ● Tracking point ● X-Value

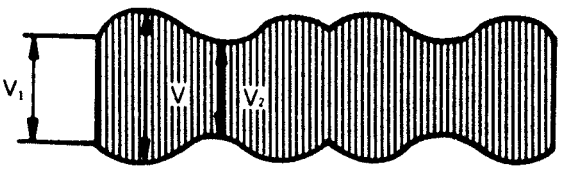
Connection Diagram



Checking/Adjustment Procedure

1) Run the blank tape, check and adjust whether the Roller Guide is curling or creasing tape around the Roller Guide.
2) Check the RF envelope output flatness and adjust the Roller Guide Height while playing an alignment tape.
3) Adjust the head switching point.
4) Check that RF envelope output is maximum when the tracking is at the initial position.
5) Adjust the Tracking Preset and X-Value Adjust with X Adjust.

Waveform Diagram



V_1/V MAX $\geq$ 0.7
V_2/V MAX $\geq$ 0.8
RF ENVELOPE OUTPUT

Fig. C-8

9. Check of Tape Travel after reassembling Deck Assembly

9-1. Check Audio and RF Locking Time during playback after CUE or REV.

Test Equipment/Fixture	Specification	Test Equipment Connection Point	VCR State
● Oscilloscope ● Alignment tape (with 6H 3kHz Color Bar Signal) ● Stop Watch	● RF Locking Time : Less than 5 sec. ● Audio Locking Time : Less than 10 sec.	● CH-1 : PB RF Envelope ● CH-2 : Audio Output ● RF Envelope Output Point ● Audio Output Jack	● Play an alignment tape (with 6H 3kHz Color Bar Signal)

Checking Procedure

1) Change the mode of CUE or REV to play.
2) At this time, confirm that the Locking Time of Audio and RF Output Waveform fits to specification.
3) If the results checked above are abnormal, reapeat adjustments 4 through 8.

※ 6H : LP

9-2. Check the coincidence of both Audio and Video Sync.(Lip Sync.)

Test Equipment/Fixture	Specification	Test Equipment Connection Point	VCR State
● Oscilloscope ● 2H 9V Tape(for X-Value Adjustment Coincidence) or alignment tape	● Less than ±0.5V	● CH-1 : PB RF Envelope ● CH-2 : Audio Output ● RF Envelope Output Point ● Audio Output Jack	● Play a 2H 9V tape or an alignment tape.

Checking Procedure

1) Confirm that the period Ⓐ of Fig. C-9-1 is within ±0.5V.
2) If the result is abnormal, repeat adjustment #7. (X-Value adjustment).

※ 2H : SP, V : Vertical

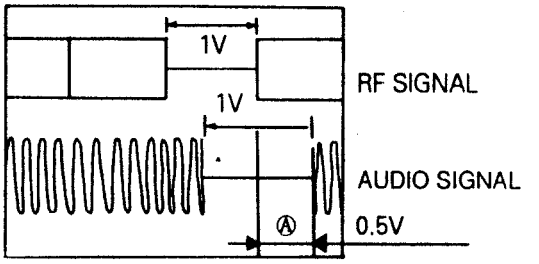


Fig. C-9-1

9-3. Check the occurance of tape curl and jam

Test Equipment/Fixture	Specification	VCR State
● T-160 Tape ● T-120 Tape	● Be sure there is no jam or curl at the beginning, the middle period or the end of the T-160 tape.	● Run the CUE, REV play mode at the beginning and the end of the tape.

Checking Procedure

1) Confirm whether the state of each transportation post is normal.
2) Make sure nothing is wrong with the operation of the Counter, when the lower part of tape is folded.
3) Be sure there is nothing wrong in the Audio signal, when the upper part of tape is folded.
4) If the result is abnormal, repeat adjustment #5 and #6.

9-4. Check the adjustment state of Take-Up Guide

Test Equipment/Fixture	Specification
● T-120 Tape ● Take-Up Guide Adjusting Driver	● Review : Travel the tape that align the top of the P4 Guide and the bottom of the Tape or be folded. ● Play : Travel the tape that align the top of the P4 Guide and the bottom of the Tape.

Checking Procedure

1) Run the CUE or PLAY mode at the middle period or the end of the T-120 tape.
2) Run the REV mode at the play or cue part of tape.
3) At this time, confirm that the change of tape height at the P4 Guide fits to specification.
4) If the result is abnormal, refer to Table 9-1.
5) Play the beginning of T-120 tape(within 5 min.)
6) Confirm that the state of tape transportation fit to specification in P4 Guide.
7) Remove the Tension Arm Assembly by rotating in the clockwise direction and then confirm that the state of tape transportation fit to specification.
8) If the result is abnormal, refer to Table 9-1.

PLAY Mode	REV Mode	Adjustment Method
Tape Falling	Tape Lift	Bend the shaft of the direction +Y.
Tape Lift	Tape Falling	Bend the shaft of the direction -Y.

Table 9-1

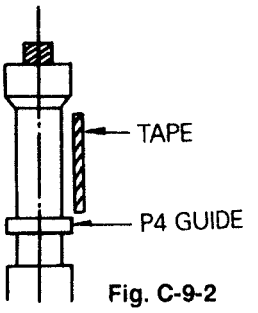


Fig. C-9-2

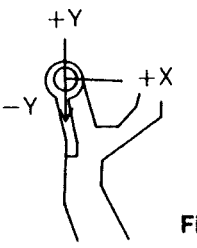


Fig. C-9-3

10. Maintenance/Inspection Procedure

(1) Required Maintenance

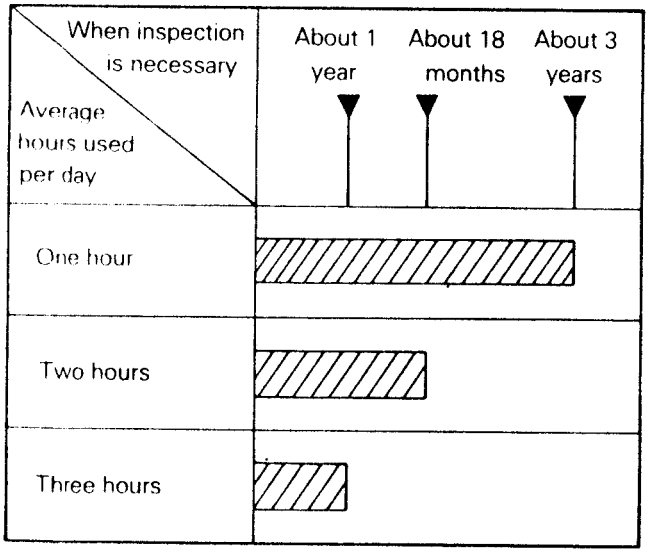
The recording density of a VCR is much higher than that of an audio tape recorder. VCR components must be very precise, at tolerances of 1/1000mm, to ensure compatiblity with other VCRs. If any of these components are worn or dirty, the symptoms will be the same as if the part is defective. To ensure good picture, periodic inspection and maintenance, including replacement of worn out parts and lubrication, are necessary.

(2) Scheduled Maintenance

Schedules for maintenance and inspection are not fixed because they vary greatly according to the way in which the customer uses the VCR, and the environment in which the VCR is used.

But, in general home use, a good picture will be maintained if the inspection and maintenance is made every 1,000hours. The table below shows the relation between time used and inspection period.

Table 1



(3) Check before starting repairs

The following faults can be remedied by cleaning and oiling. Check the needed lubrication and the conditions of cleanliness in the unit.

Check with the customer to find out how often the unit is used, and then determine that the unit is ready for in spection and maintenance. Check the following parts.

Table 2

Phenomenon	Inspection
Poor S/N, no color	Dirt on video head or worn video head
Tape does not run or tape is slack	Dirt on pressure roller, belt or flywheel belt
Vertical jitter, horizontal jitter	Dirt on video head or in tape transport system
Color beats	Dirt on full-erase head
Low volume or sound distorted	Dirt on audio/control head
Fast forward or rewind is not done or rotation is slow	Dirt on belt

(4) Supplies Required for Inspection and Maintenance

(1) Greases Kanto G-31(or equivalent)
(2) Alcohol(Isopropyl Alcohol)
(3) Cleaning Patches

5) Maintenance Procedure

5-1) Cleaning

(1) Cleaning video head

First use a cleaning tape. If dirt on head is too stubborn to remove by tape, use the cleaning patch. Coat the cleaning patch with alcohol(Isopropyl Alcohol) to the point indicated. Touch the cleaning patch to the head tip and gently turn the head(rotating cylinder) right and left.

(Do not move the cleaning patch vertically and make sure that only the buckskin on the cleaning patch comes into contact with the head. Otherwise, the head may be damaged.)

Thoroughly dry the head. Then run test tape. If alcohol (Isopropyl Alcohol) remains on the video head, the tape may be damaged when it comes into contact with the head surface.

(2) Clean the tape transport system and drive system, etc, by wiping with a cleaning patch wetted with alcohol (Isopropyl Alcohol).

Note:

(1) It is the tape transport system which comes into contact with the running tape. The drive system consists of those parts which move the tape.

(2) Make sure that during cleaning you do not touch the tape transport system with the tip of a screw driver and no force is applied to the system that would cause deforming.

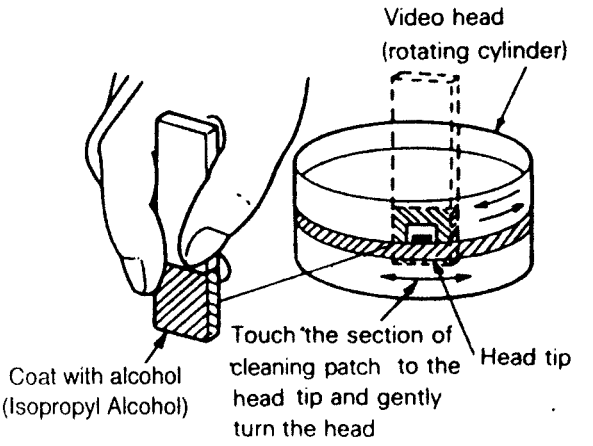


Fig. C-10-1

5-2) Greasing

(1) Greasing guidelines

Apply grease, with a cleaning patch. Do not use excess grease. It may come into contact with the tape transport of drive system. Wipe any excess and clean with cleaning patch wetted in alcohol(Isopropyl Alcohol).

(2) Periodic greasing

Grease specified locations every 5,000hours.

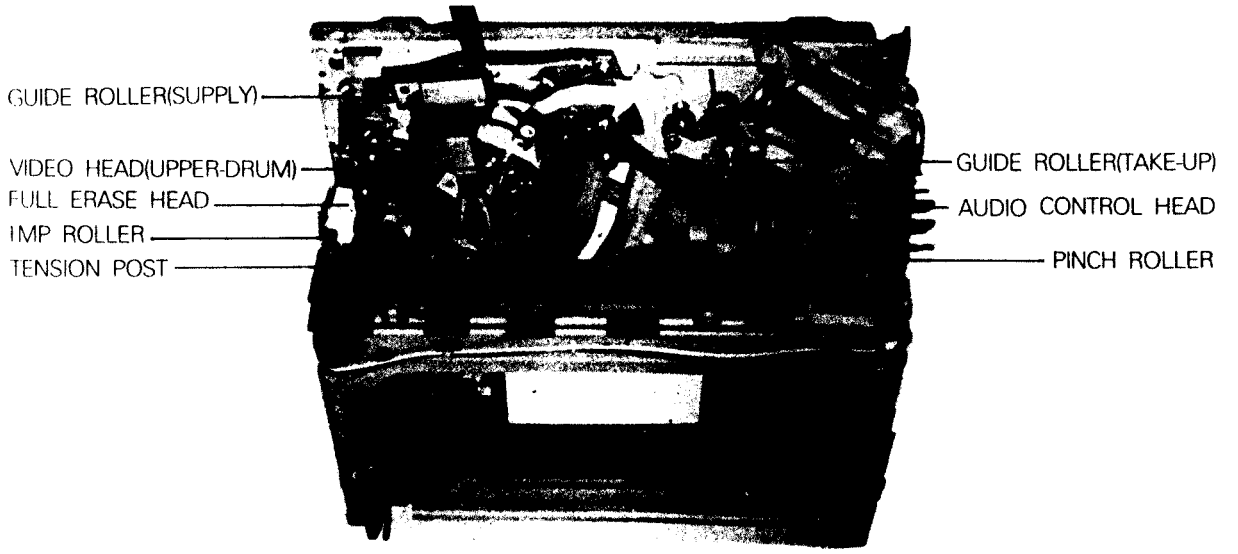


Fig. C-10-2 Tape Transport System

Phenomenon	Inspection	Replacement	
Color beats	Dirt on full-erase head	○	→ ①
Poor S/N no color	Dirt on video head	○	→ ②
Vertical jitter	Dirt on video head Dirt in tape transport system	○	→ ③
Low volume, Sound distorted	Dirt on audio/control head	○	→ ④
Tape does not run Tape is slack	Dirt on pinch roller	○	→ ⑤

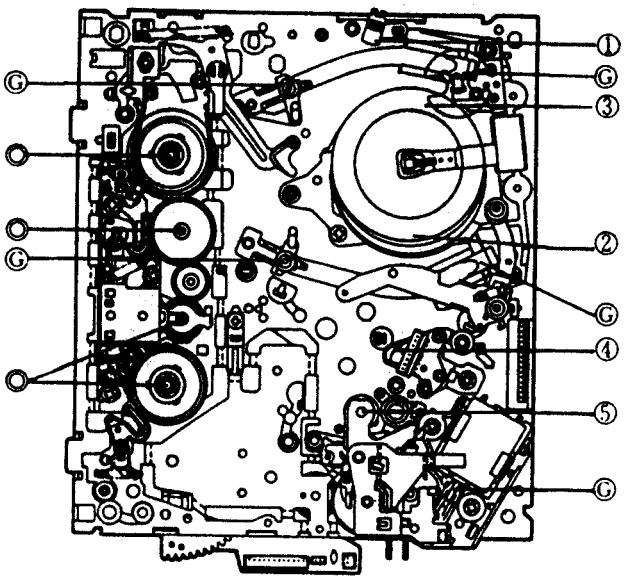


Fig. A-11 Top View of Mechanism

Phenomenon	Inspection Location	Replacement	
Do not fast forward or rewind, or rotation is slow Tape does not run Slack tape	Dirt on reel belt	○	→ ⑥

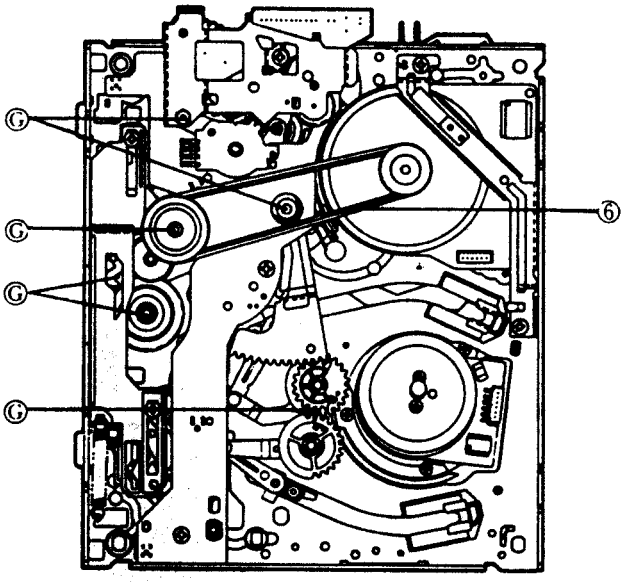


Fig. A-12 Bottom View of Mechanism

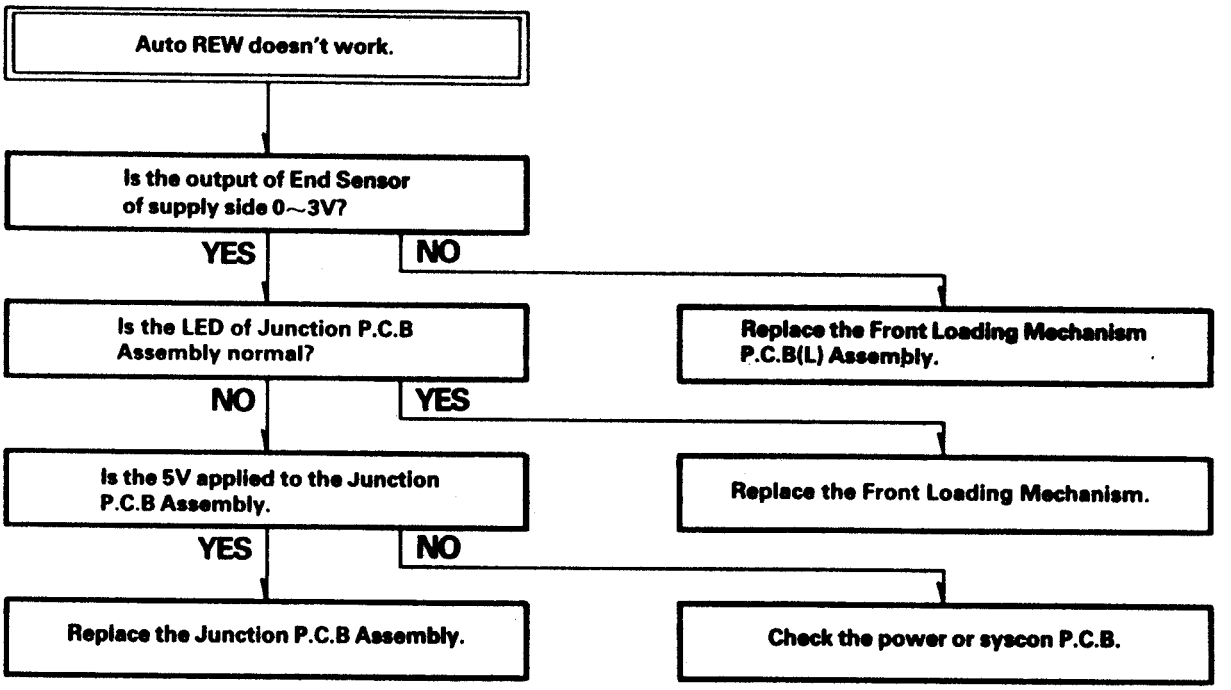
Note: If locations marked with ○ do **not operate normally** after cleaning, check for wear and replace.
See the EXPLODED VIEWS at the end of this manual as well as the above illustrations for the sections to be lubricated and greased.

Ⓖ:Grease
Ⓞ:Oil

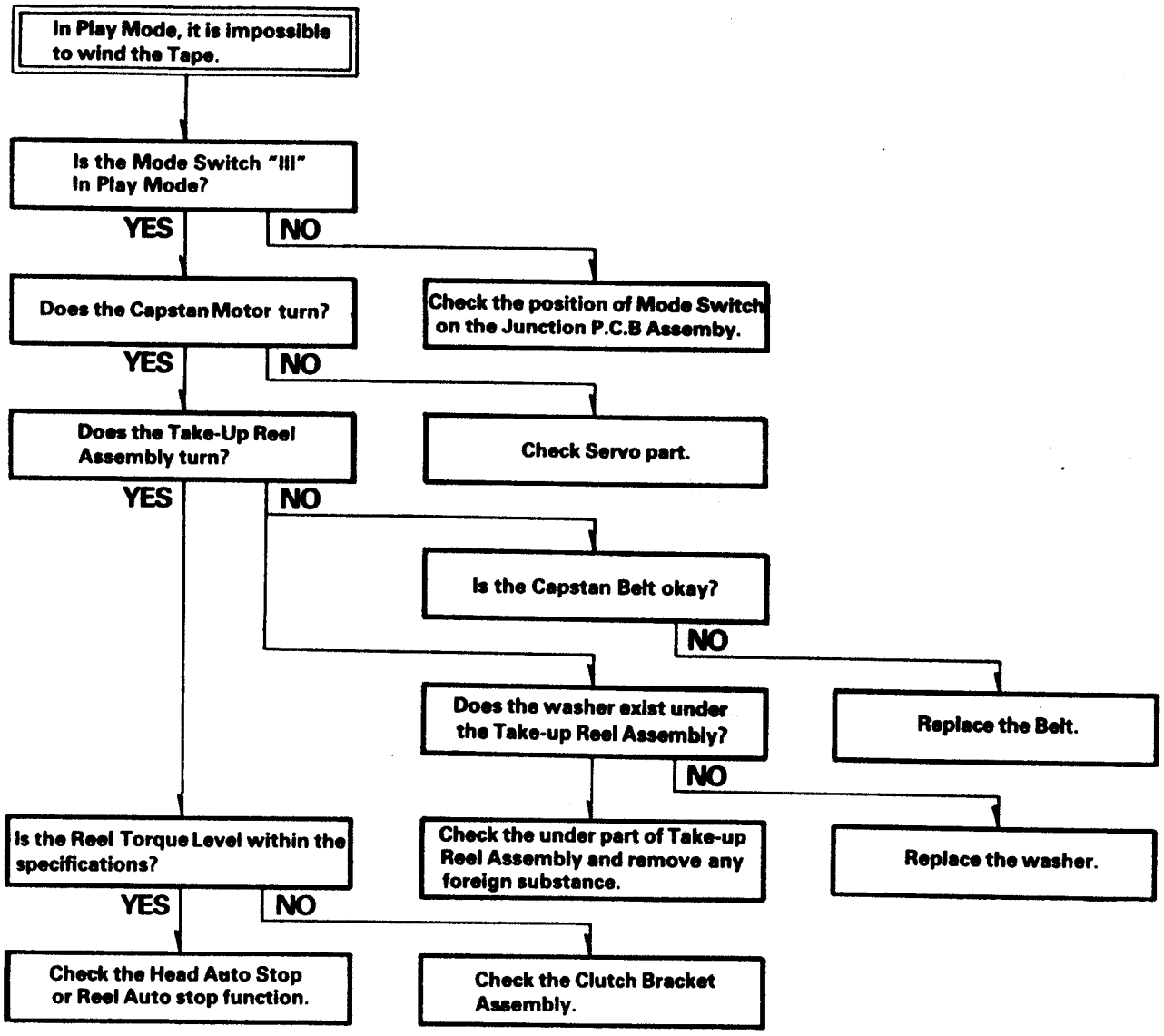
MECHANISM TROUBLESHOOTING GUIDE

1. Deck Mechanism

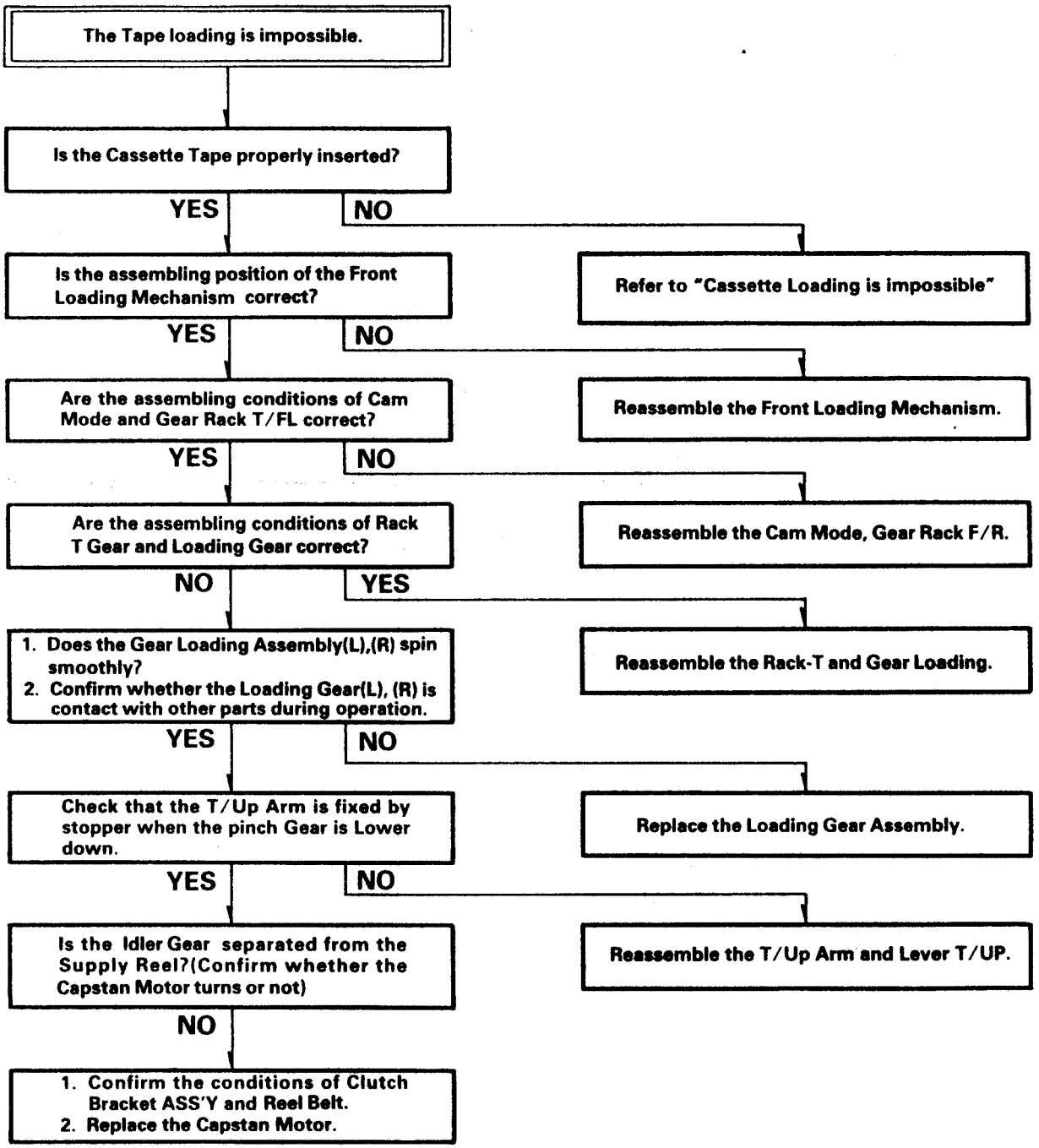
A.


Auto REW doesn't work.
Is the output of End Sensor of supply side 0~3V?
YES
NO
Is the LED of Junction P.C.B Assembly normal?
Replace the Front Loading Mechanism P.C.B(L) Assembly.
NO
YES
Is the 5V applied to the Junction P.C.B Assembly.
Replace the Front Loading Mechanism.
YES
NO
Replace the Junction P.C.B Assembly.
Check the power or syscon P.C.B.

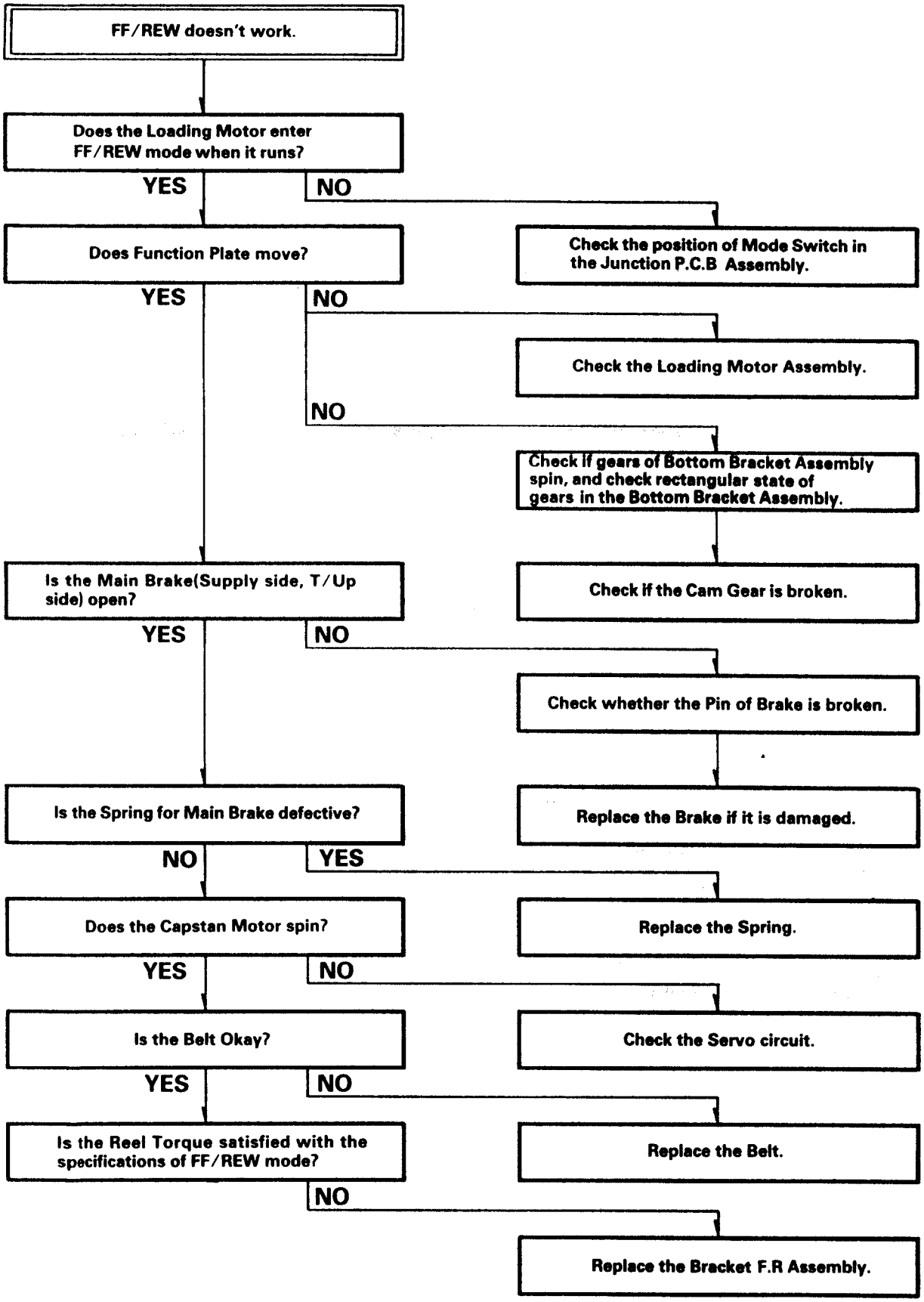
B.


In Play Mode, it is impossible to wind the Tape.
Is the Mode Switch "III" In Play Mode?
YES
NO
Check the position of Mode Switch on the Junction P.C.B Assemby.
Does the Capstan Motor turn?
YES
NO
Check Servo part.
Does the Take-Up Reel Assembly turn?
YES
NO
Is the Capstan Belt okay?
NO
Replace the Belt.
Does the washer exist under the Take-up Reel Assembly?
NO
Replace the washer.
Check the under part of Take-up Reel Assembly and remove any foreign substance.
Is the Reel Torque Level within the specifications?
YES
NO
Check the Head Auto Stop or Reel Auto stop function.
Check the Clutch Bracket Assembly.

D.

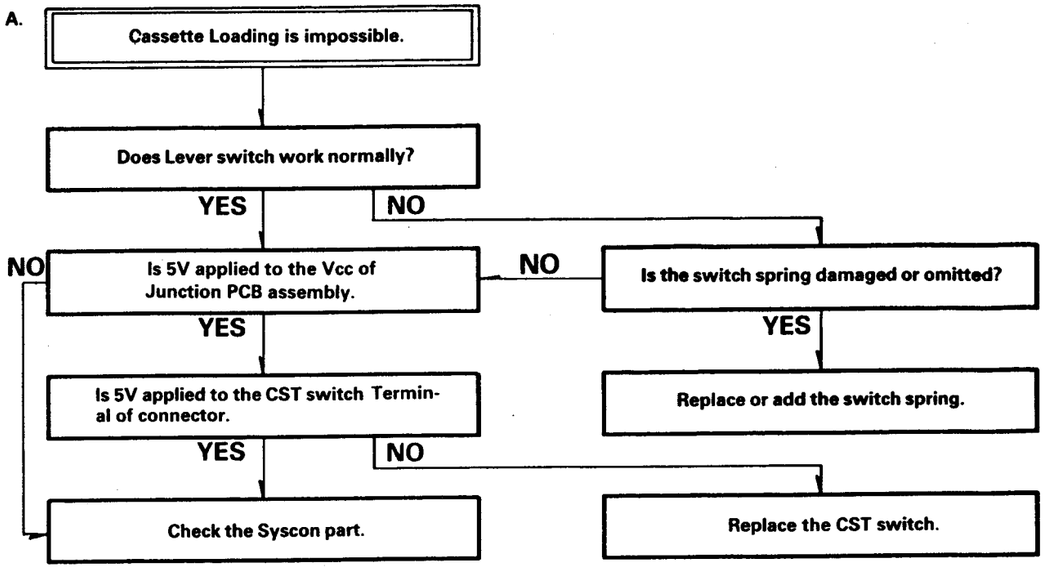

The Tape loading is impossible.
Is the Cassette Tape properly inserted?
YES
NO
Refer to "Cassette Loading is impossible"
Is the assembling position of the Front Loading Mechanism correct?
YES
NO
Reassemble the Front Loading Mechanism.
Are the assembling conditions of Cam Mode and Gear Rack T/FL correct?
YES
NO
Reassemble the Cam Mode, Gear Rack F/R.
Are the assembling conditions of Rack T Gear and Loading Gear correct?
NO
YES
Reassemble the Rack-T and Gear Loading.
1. Does the Gear Loading Assembly(L),(R) spin smoothly?
2. Confirm whether the Loading Gear(L), (R) is contact with other parts during operation.
YES
NO
Replace the Loading Gear Assembly.
Check that the T/Up Arm is fixed by stopper when the pinch Gear is Lower down.
YES
NO
Reassemble the T/Up Arm and Lever T/UP.
Is the Idler Gear separated from the Supply Reel?(Confirm whether the Capstan Motor turns or not)
NO
1. Confirm the conditions of Clutch Bracket ASS'Y and Reel Belt.
2. Replace the Capstan Motor.

C.

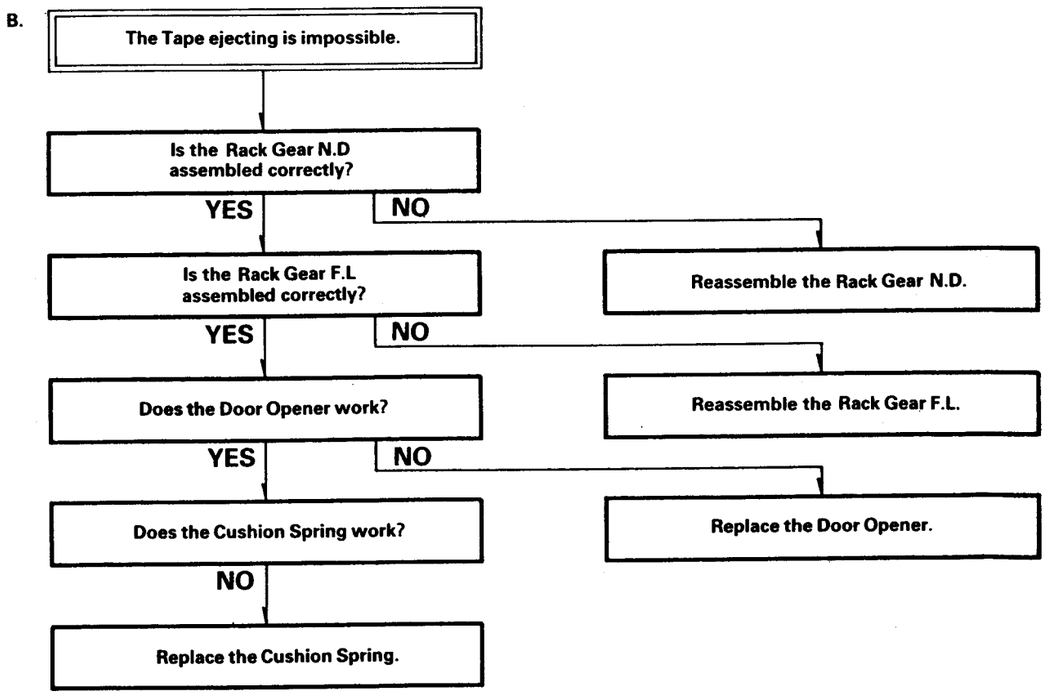

FF/REW doesn't work.
Does the Loading Motor enter FF/REW mode when it runs?
YES
NO
Check the position of Mode Switch in the Junction P.C.B Assembly.
Does Function Plate move?
YES
NO
Check the Loading Motor Assembly.
NO
Check if gears of Bottom Bracket Assembly spin, and check rectangular state of gears in the Bottom Bracket Assembly.
Is the Main Brake(Supply side, T/Up side) open?
Check if the Cam Gear is broken.
YES
NO
Check whether the Pin of Brake is broken.
Is the Spring for Main Brake defective?
Replace the Brake if it is damaged.
NO
YES
Does the Capstan Motor spin?
Replace the Spring.
YES
NO
Is the Belt Okay?
Check the Servo circuit.
YES
NO
Is the Reel Torque satisfied with the specifications of FF/REW mode?
Replace the Belt.
NO
Replace the Bracket F.R Assembly.

2. Front Loading Mechanism

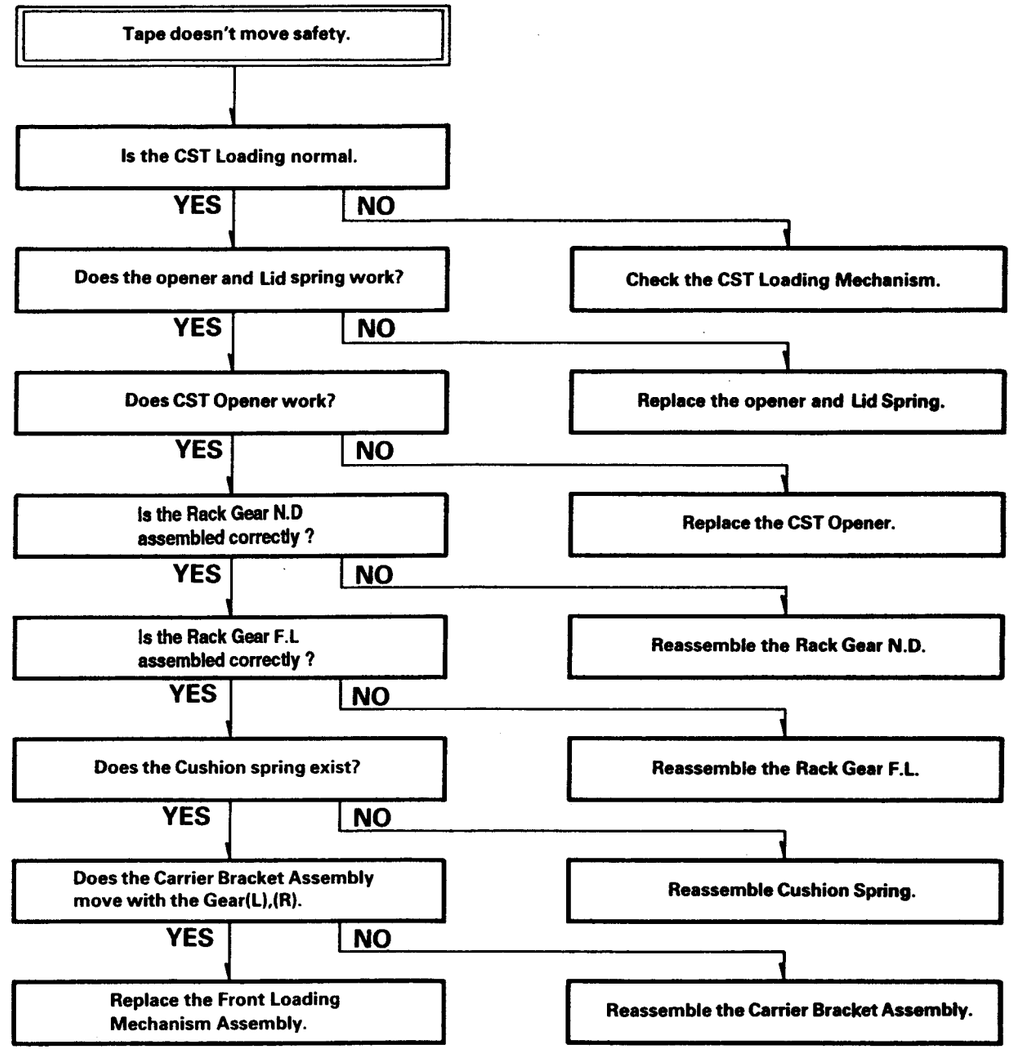
A.



B.



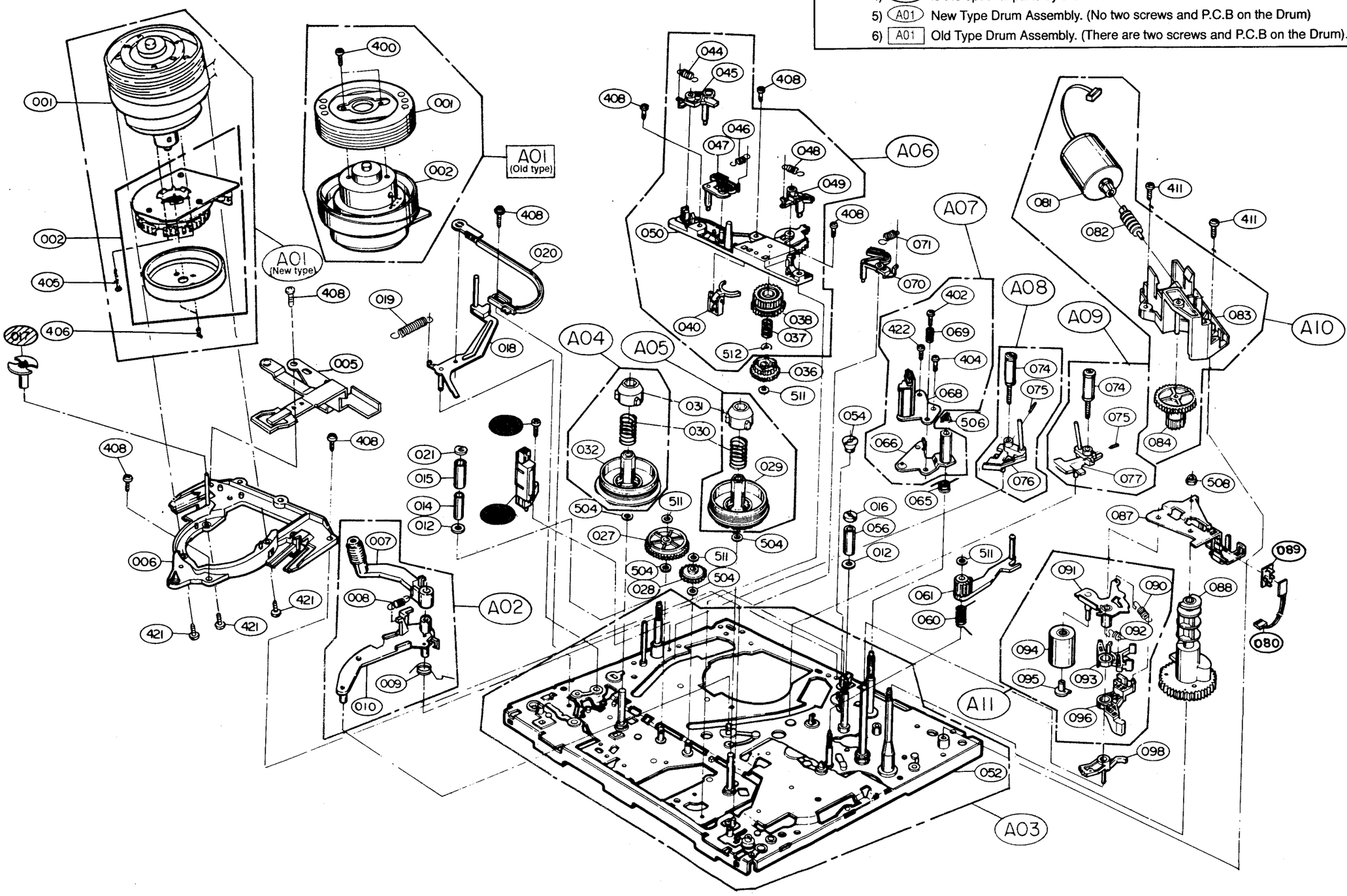
C.



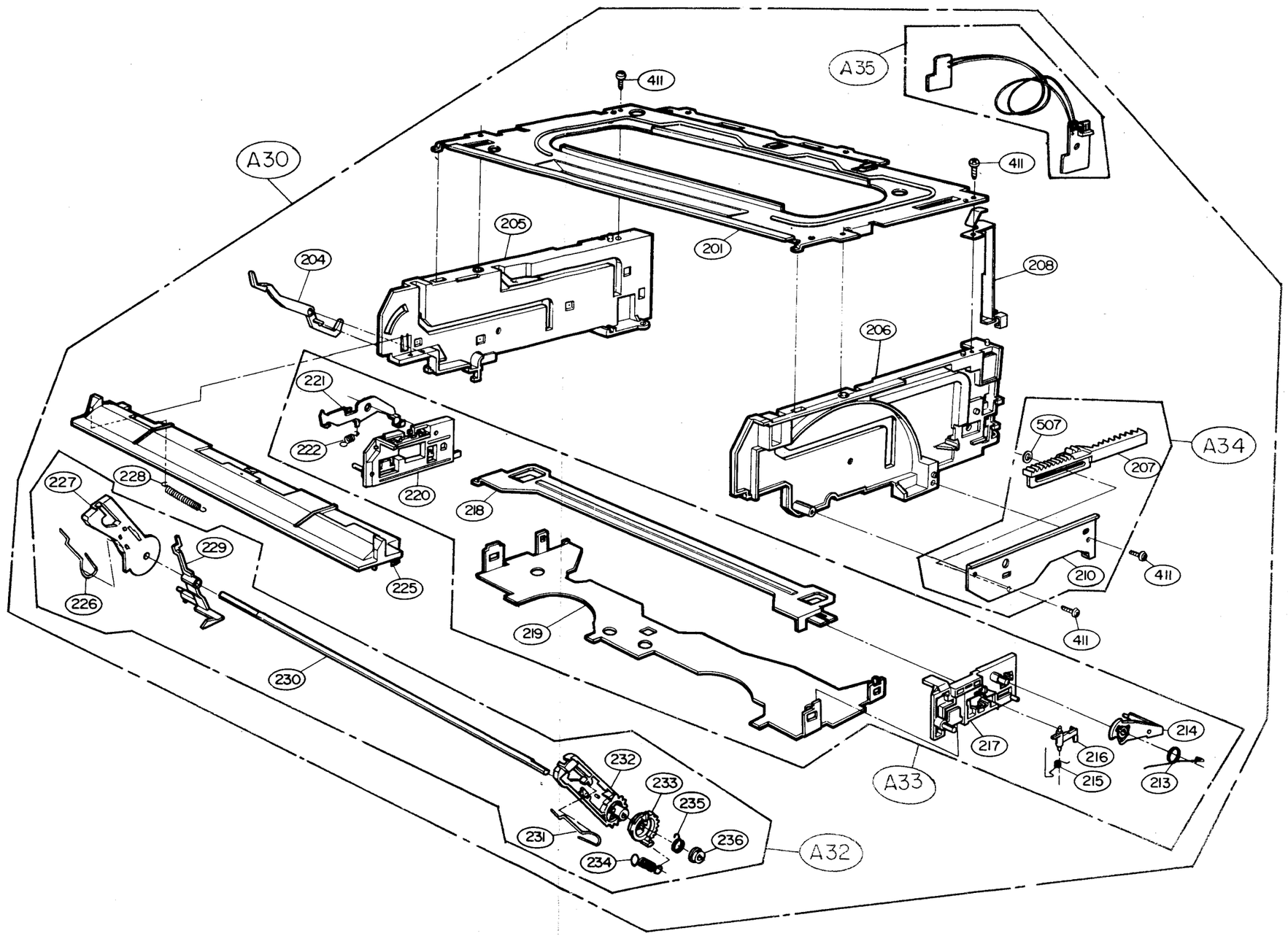
EXPLODED VIEW

1. Moving Mechanism Section(I)

NOTE) 1) ⬬ marks the optional parts only in VCR (Video Cassette Recorder) Models.
2) marks the optional parts only in VCP (Video Cassette Player) Models.
3) ▨ marks the optional parts only in Hi-Fi Models.
4) (A02) is the optional parts by the Models.
5) (A01) New Type Drum Assembly. (No two screws and P.C.B on the Drum)
6) [A01] Old Type Drum Assembly. (There are two screws and P.C.B on the Drum).



3. Front Loading Mechanism Section



2. Moving Mechanism Section(Ⅱ)

NOTE) 1) (119) is the optional parts by the Models.